- Adhesives in the paper industry
- Standard cost accounting
- New supercalender drive
- Pipe, fittings, valves and pumps in power and steam generation

The Paper Industry

ACTION! WHEN YOU CALL ON NALCO FOR ANTIFOAM SERVICE

First, Nalco has the Antifoam Chemicals to meet pulp and paper mill foaming problems effectively . . . and *second*, when you call your Nalco Field Service Man for service you get *real action!*

Your Nalco Representative has test equipment, chemicals and portable feeding equipment . . . ready to go to work, quickly, to solve your foaming problems. With Nalco antifoams on the job, you will get outstanding air release, better washing of stock and substantial reduction in pitch deposits. And Nalco antifoams will result in better formation and better drainage on the paper machine.

When you want antifoam ACTION, call Nalco.

NATIONAL ALUMINATE CORPORATION

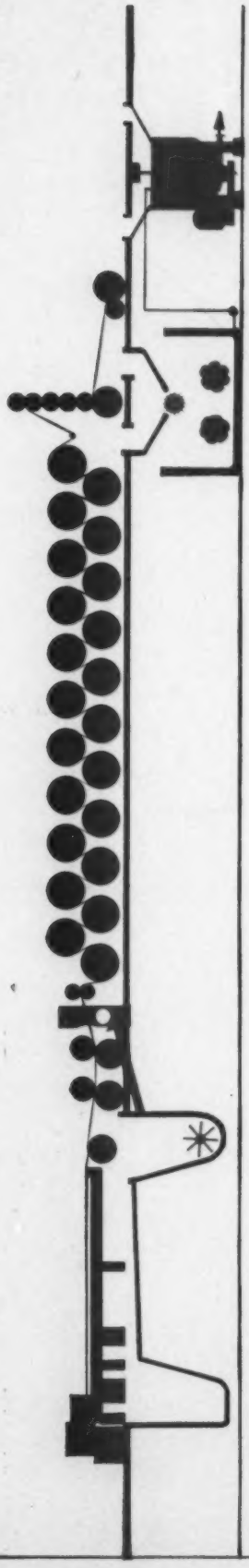
6232 West 66th Place Chicago 38, Illinois

CANADA: Alchem Limited, Burlington, Ont. • NORTHWESTERN UNITED STATES, HAWAII and ALASKA: The Flox Co., Inc., Minneapolis 3, Minnesota • ITALY: Nalco Italiana, S.p.A. GERMANY: Deutsche Nalco-Chemie GmbH • SPAIN: Nalco Espanola, S.A.

THE *Nalco*® SYSTEM

Serving the Paper Industry through Practical Applied Science

PUBLIC LIBRARY NOV DETROIT



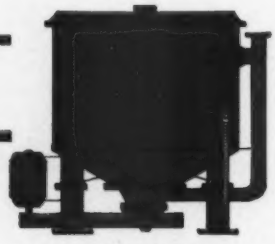
IMPCO OFFERS COMPLETE *BROKE PULPING* AT ALL POSITIONS ON YOUR PAPER MACHINE

Over two thousand Impco Agitators for every conceivable mill requirement, both before and after the paper machine, are in successful operation. As a pioneer in the designing of such equipment, Impco also regularly builds broke handling devices for various positions under the paper machine. Consequently, such units as Couch Pit Agitators, Sheet and Roped Press Broke Shredders, Dry Sheet Shredders, Solvo Pulpers and Defiberers have been developed. As a result of this mill proven experience, Impco can provide you with either a complete broke handling system or individual components.

Press Broke Shredder

Weedless Repulper

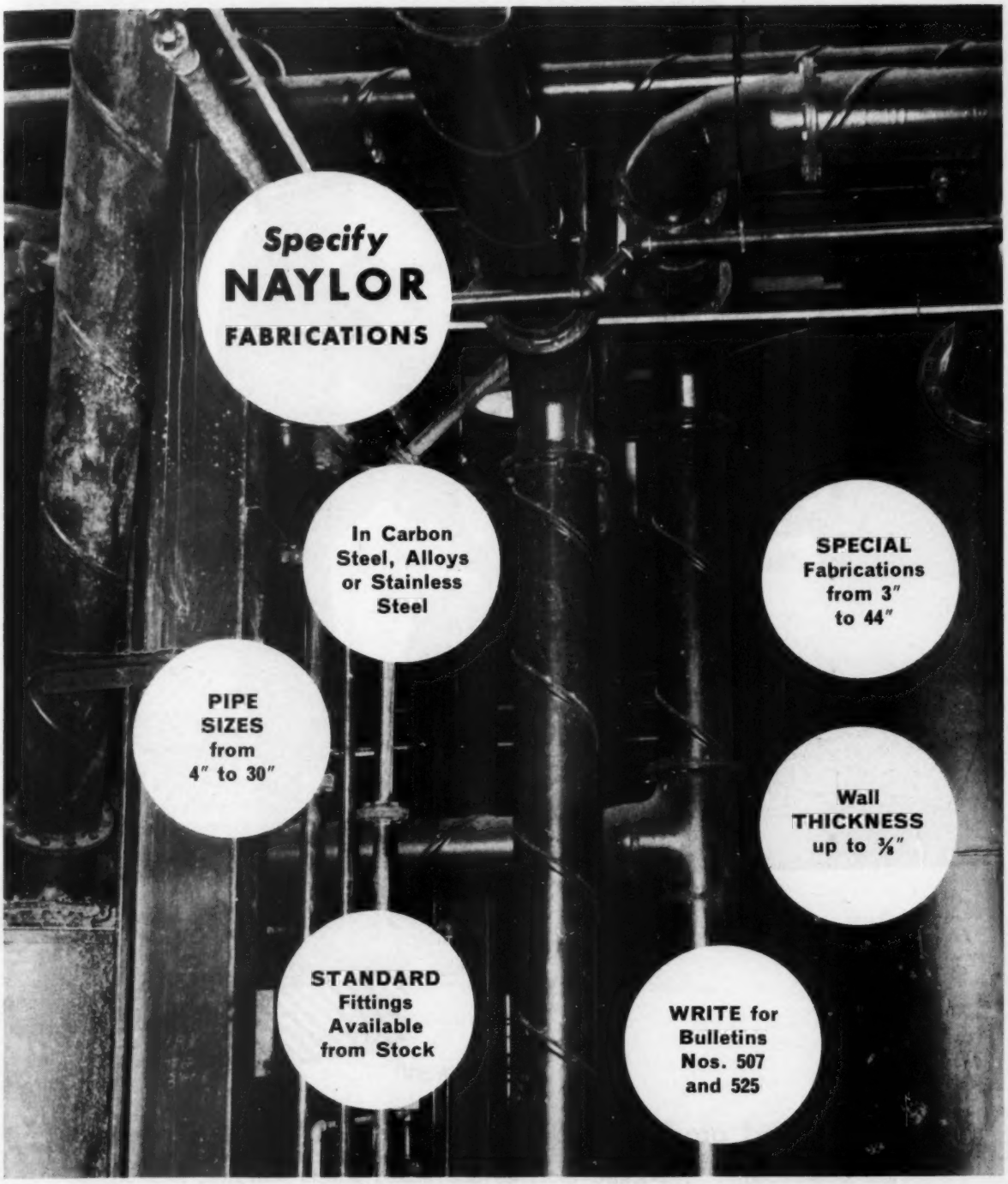
Dry Sheet Shredder



Solvo Pulper

IMPCO® IMPROVED MACHINERY INC.
NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec


Specify
NAYLOR
FABRICATIONS
In Carbon Steel, Alloys or Stainless Steel
SPECIAL Fabrications from 3" to 44"
PIPE SIZES from 4" to 30"
Wall THICKNESS up to ⅜"
STANDARD Fittings Available from Stock
WRITE for Bulletins Nos. 507 and 525

NAYLOR PIPE Company

1233 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

Paperboard products get a real lift with TITANOX*. Packaging with greater point-of-sales appeal . . . book and magazine stocks with greater contrast and less show-through . . . opacified glassines and waxed papers with high legibility—all share in the matchless whitening, brightening and opacifying power of TITANOX titanium dioxide white pigments.

To achieve these results, papermakers can choose from among such white pigments as TITANOX-A-WD, TITANOX-C-50, or TITANOX-RA-50. Whether used at the beater or in the coating, TITANOX white pigments insure easy mixing, complete dispersion and uniformity of all properties. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities.

TITANIUM PIGMENT CORPORATION

Subsidiary of **NATIONAL LEAD COMPANY**

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

5729

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 40 **NUMBER 8** **NOVEMBER 1958**

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

Editorial Director
A. W. J. DYCE, Ph.D.

News Editor
D. W. ZEIGLER

Market Analyst
JEROME KASSIDAY

Advertising and Production Manager
CHARLES E. DOWD

Circulation Manager
JOHN H. REARDON

Assistant Circulation Manager
LEONA M. NUTTALL

Advertising Representatives:

CHICAGO 5: **Jack Henderson,** 431 South Dearborn Street, Wabash 2-3543

CLEVELAND 7: **Richard E. Cleary, Inc.,** 15515 Detroit Avenue, Lakewood 1-7125

EASTERN: **Jack Bain Company,** 545 Fifth Avenue, New York 17, N.Y. Murray Hill 2-3345

SOUTHEASTERN: **Fred W. Smith,** 1201 Forest View Lane — Vesthaven, Birmingham 9, Ala., Tremont 1-5762

WEST COAST: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Ryan 1-9155

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950 issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence to:
Fritz Publications, Inc.
431 South Dearborn Street
Chicago 5, Illinois

BPA

Member: Business Publications Audit of Circulation Inc.

Accepted as controlled circulation publication at Mendota, Ill.

Subscription rates: United States, U. S. Possessions and Canada $3.00 for one year. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

Features . . .

Editorial — A glamor status for adhesives 505

Whither? — Desiccant dusts lethal to insects — Fertilizer pellets for forest seedlings — An engineering understanding of the structure of papermaking materials needed — Lease plan as a sales booster — Cost of papermaking capacity .. 572

Falls Paper & Power wins Edward Benton Fritz Trophy 512

Adhesives in the paper industry — Part I 515

Standard cost accounting for paper mills — Part I 518
by Edward W. Rogers

Supercalender drive at Eastman introduces new system 522
by Charles D. Beck

The use of pipe, fittings, pumps and valves in the pulp and paper industry — Part VI 524
by Roland L. Allen Jr.

46th Safety Congress spotlights Falls Paper & Power, Celotex 525

Swedish success means a Nova Scotia mill 535

FBA sees higher demand for shipping containers 535

Gilbert to install Valley Iron machine 535

News . . .

News of the Industry 535
Names in the News 545
Necrology 546

Departments . . .

Current Comments 533
Coming Events 543
Patent Reviews 548
Foreign Abstracts 553
New Products 557
New Literature 565
Market Quotations 569
Index to Advertisers 571

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

© 1958 by Fritz Publications, Inc.

Vancide®

51 Z DISPERSION

FUNGICIDE and BACTERICIDE

very low order of toxicity
not a primary irritant

for use as a
SLIMICIDE
safe at recommended levels

R. T. VANDERBILT CO., Inc.

230 PARK AVENUE · NEW YORK 17, N. Y.

From our point of view..

A glamor status for adhesives

WITH THE introduction in this issue of Part I of the series on adhesives in the paper industry, it is appropriate to pinpoint their major uses in the light of the increasingly more important role they play in paper manufacture.

While adhesives have been used in papermaking since the inception of the industry, it is only in recent years that they have ascended to the glamor status they now hold in general industrial applications.

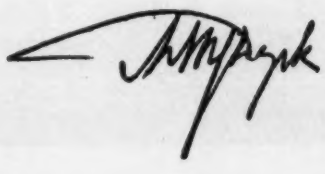
Modern adhesives technology has made it possible to glue metal parts together and to develop bond-strength ranging from 2000 psi to 75,000 psi — depending on the surface and the metals used. Such bonds are strong enough to eliminate the use of rivets in many applications — especially in aircraft construction. A recent report even mentions successful attempts at repairing bone fractures with the use of adhesives.

In the paper industry adhesives have become an integral part of every package. In addition to their function of holding the package together, many adhesives now possess properties that insure efficient and economic processing of packages even at the high speeds characteristic of modern equipment.

Apart from their impressive role in packaging, adhesives also play equally indispensable parts in the manufacture of corrugated board and laminated, coated and impregnated papers. In addition, there are pressure-sensitive and heat-sealing adhesives that have given rise to many new concepts and applications in the paper and paper converting fields.

Another area in which certain adhesives — especially animal glues and rosins — contribute to the technology of papermaking is that of surface and internal sizing, flocculation for retention and stock recovery in savealls, and in raw and waste water treatment. Their importance here is not so much due to their adhesive as to their collodial properties.

With the continuing trend toward the improvement of paper products and the constantly increasing new paper products and new applications, the quality and performance of adhesives is destined to become one of the most critical factors in the production picture of the paper industry. A thorough familiarity with adhesives and their properties will undoubtedly determine the future success of many mills in this industry.



Whatever your system, you'll find

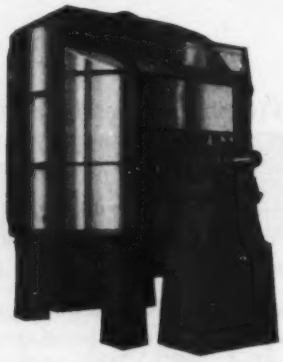
TOP QUALITY Jones® EQUIPMENT

Soundly engineered to help you produce

BETTER STOCK MORE ECONOMICALLY

Jones

JORDANS — A size for every need — plus wide choice of tackle and plug adjustment mechanisms. Split small heads avoid necessity of dismounting bearings. Ask for Bulletin EDJ-1007B

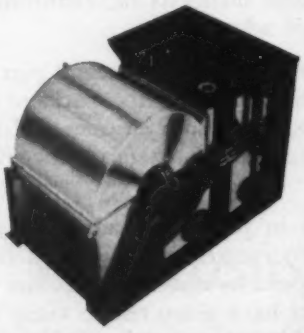


Jones

HI-LO PULPER — Two separately powered rotors provide maximum pulping and complete defibering of even the toughest wet strength materials. Details in Bulletin EDJ-1063B.

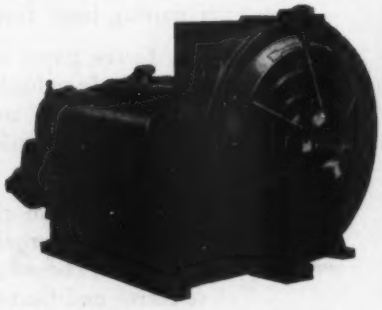
Jones

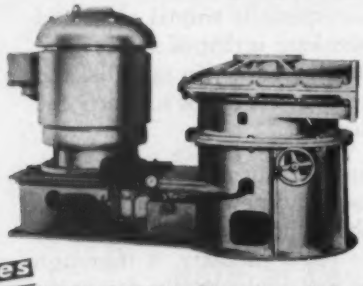
BEATERS — Complete "packaged" units of proven Jones-Bertrams design give better formation, more uniform treatment, substantial savings in time and operating cost. Bulletin EDJ-1079.



Jones

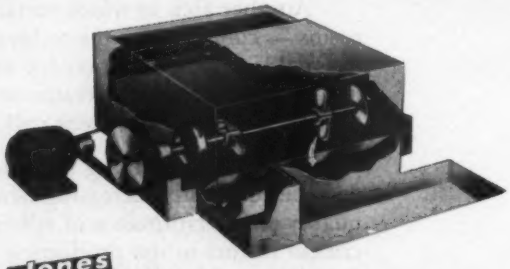
DOUBLE - D REFINER — Exclusive double refining area permits *two stages of refining in one pass* — does twice the work and produces better quality stock Ask for Bulletin EDJ-1083.





Jones

ROTO-PULPER — Compact, vertical, single disc refiner designed to handle high-consistency stock. Variety of interchangeable plates for mixing bleach, defibrating, decorticating, shredding, etc.



Jones

LIEBECK DISINTEGRATORS — Low cost slushing for soft pulp, and broke not containing wet strength substances. Units and tanks custom-designed to fit your needs and space. Bulletin EDJ-1061.

Jones

Export Agents: CASTLE & OVERTON, INC., New York 20, New York

THE WHITEST WHITE YOU'VE EVER SEEN

ALBERTA HI-BRITE was promised to be the one bleached kraft pulp that will make your furnish white enough, bright enough for producing even the finest writing papers. This it is—*and more!*

You get the whiteness. And you get extra-high folding and tensile strength. You get formation and printability usually associated only with low-strength pulps. Uniquely, Hi-Brite develops these good characteristics whether your product calls for light or extensive refining. And you can be sure of an on the continent supply of Hi-Brite, thanks to over 400-tons-daily output.

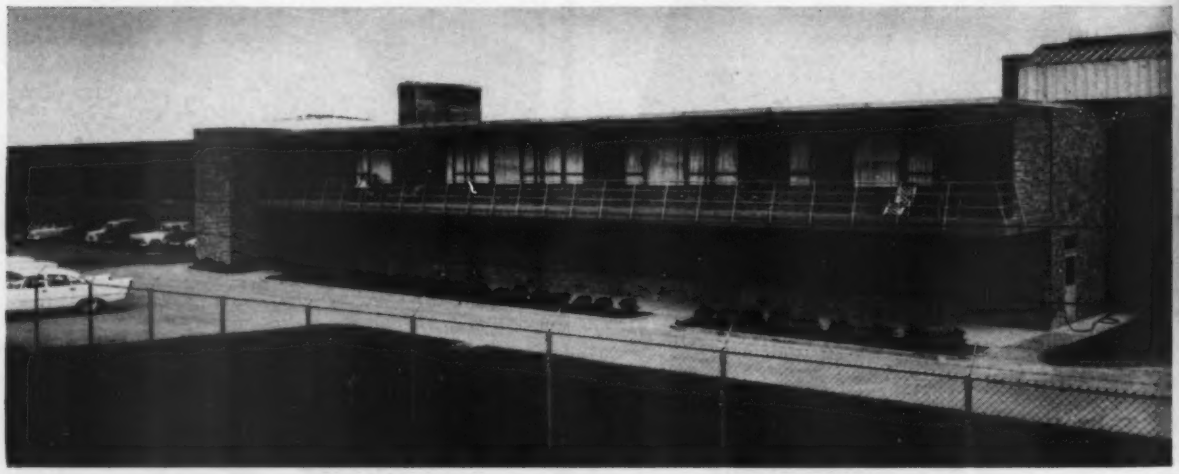
For full information on how Hi-Brite can improve the quality of your product, write: St. Regis Paper Company, Dept. PI-1158, 150 East 42nd Street, New York 17, New York; or write your nearest St. Regis Pulp Sales Office.

KRAFT AND CONVERTING PRODUCTS DIVISION

St.Regis PAPER COMPANY

PULP SALES OFFICES: NEW YORK • CHICAGO • SAN FRANCISCO • TORONTO • MONTREAL

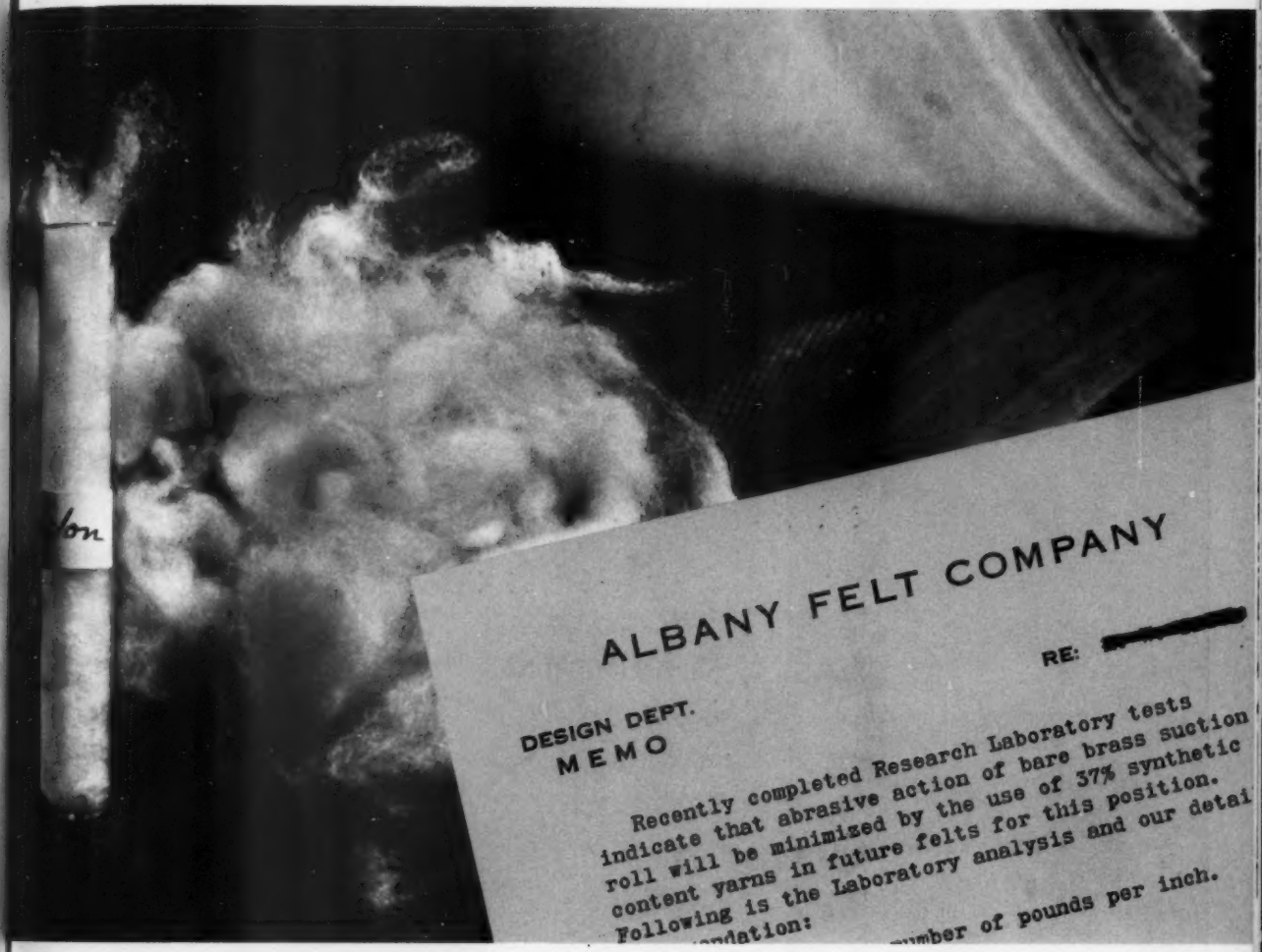
This is the world's most modern, most efficient Fourdrinier wire weaving plant. Appleton's Montgomery plant is equipped to produce wires for the widest, fastest machines being built. In operation since 1955, the AWW-designed equipment is already working at capacity supplying Fourdrinier wires for machines all over the country. The Montgomery operation is just one of three AWW plants equipped to fill all your Fourdrinier wire requirements. Appleton's 62 years experience and ability are your best answer to profitable Fourdrinier wire performance. We invite you to discuss your wire needs—or problems—with an AWW representative.



APPLETON WIRES ARE GOOD WIRES

Appleton Wire Works, Inc. • Plants at Appleton, Wis. and Montgomery, Ala. • International Wire Works, Menasha, Wis.

WHERE EVERYTHING STARTS WITH RESEARCH


ALBANY FELT COMPANY
RE:
DESIGN DEPT.
MEMO
Recently completed Research Laboratory tests
indicate that abrasive action of bare brass suction
roll will be minimized by the use of 37% synthetic
content yarns in future felts for this position.
Following is the Laboratory analysis and our detai
mber of pounds per inch.

TAKE SYNTHETICS...

A dozen years ago, Albany's laboratories produced—and patented—the first synthetic-content felts ever made. Since then, constant research and on-the-machine experience have provided Albany with the industry's most complete bank of knowledge on the *correct* use of synthetics. This includes an awareness that synthetics are NOT an automatic cure for ALL felt problems. Every individual problem or production goal is thoroughly analyzed before a "prescription" is made. But when synthetics *are* the answer, you can be sure that a synthetic-content felt from Albany will do the job better. It stands to reason! We never lose sight of "The Big Picture" . . . helping *you* produce more saleable tons per day.

ALBANY FELT COMPANY
MAIN OFFICE & PLANT, ALBANY, N.Y.
OTHER PLANTS: HOOSICK FALLS, N.Y.; N. MONMOUTH, ME., ST. STEPHEN, S.C.; COWANSVILLE, P.Q.

NEW IDEAS FOR BETTER PAPERMAKING—FROM THE WORLD'S LARGEST MANUFACTURER OF PAPER MACHINE FELTS

POWELL

world's largest family of valves*

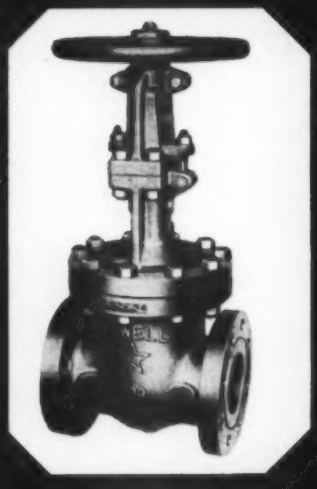


Fig. 3003 — Steel Gate Valve for 300 pounds. Outside screw rising stem and bolted flanged yoke. Also available with welding ends. Powell Steel Valves can be supplied for pressures from 150 through 2500 pounds.

Fig. 2192 — Large Ni-resist Swing Check Valve for 200 W. O. G. Permits full unobstructed flow through when disc is in wide open position. Can be used in horizontal or vertical position.

Fig. 1893 — Large O. S. & Y. Gate Valve for pulp and paper mill service. 200 pounds W. O. G. 3½% Nickel-iron body, bonnet, yoke, 18-8S Mo. stem and screwed-in seat rings; Ni-resist guided solid wedge disc.

Small Flush Bottom Tank Valves for 150 W. P. made in two designs. Fig. 2172 disc opens into tank; Fig. 2173 disc opens into valve. Available in a number of metals and alloys; also for 300 and 600 W. P.

Fig. 2600 — New, 150-pound Bronze Full Flow Globe Valve. 500 Brinell hardened, stainless seat ring and disc. Nominal pipe size seat opening and extra high lift of disc assure full flow with minimum pressure drop and turbulence. Can be supplied with indicator collar and arm for visual control. 200 and 300 pound valves also available.

Fig. 1559 — Steel Lubricated Plug Valve for 200 pounds W. O. G. — A. S. A. 150 pounds. Screwed gland type. Single gland and bolted gland types can also be furnished. Large valves — 6" and above — can be supplied with gears for gear operation.

*and in this family there's a valve for every flow control requirement—for handling water, oil, gas, air, steam and corrosive fluids—available in the most required sizes and types. If your local distributor can't supply you, or if you need specially engineered valves for unusual conditions, write

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

Tight space? Perfect place for a Link-Belt Gearmotor

Maintains life-long alignment with flange-mounted NEMA motors

Here's a speed reducer right in step with industry's campaign for higher productivity in less space. Because its gear trains incorporate a minimum of parts . . . because its motor is directly connected to the gear drive with a flange—the Link-Belt Gearmotor is the ultimate in compactness.

Imagine how these same features cut costs. The flange connection eliminates additional coupling devices. Simple gear trains have fewer parts to wear, to service, to invite trouble.

You'll find them in Book 2447. Call your authorized Link-Belt stock-carrying distributor or nearby Link-Belt office.

LINK-BELT

SPEED REDUCERS

LINK-BELT MOTOGEAR—for bracket-mounting all makes and enclosures of foot-type NEMA motors — simplifies motor replacement. Sizes to 100 hp.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.808

Over-all plant scene shows scope of operations at Falls Paper & Power Co. at Oconto Falls, Wis., winner of the 1957 Edward Benton Fritz Memorial Trophy. The mill employs approximately 350 people and operates a sulfite pulp mill, two fourdrinier paper machines and a converting department manufacturing industrial towels and household wax paper. To the right is a view of the main plant entrance.

Somewhat of a community project . . .

Falls Paper & Power wins Edward Benton Fritz Trophy

SAFETY at Falls Paper & Power Co. does not stem altogether from mill effort; it is somewhat a community project. Not that the accident-prevention program at the mill can or will be relaxed. By no means.

And yet, with safety consciousness permeating almost every home in Oconto Falls, Wis., the reduction of accidents at this subsidiary of Scott Paper Co. has grown into a group effort that goes far beyond the confines of the plant itself.

This was not happenstance. It required great effort on the part of management and employees alike. And required above all was the creation of safety consciousness. That consciousness—without becoming a mania—has resulted in national recognition for Oconto Falls.

At the National Safety Congress in Chicago during October, Falls Paper & Power was cited as the winner of the Edward Benton Fritz Memorial Trophy. This recognized 771,762 man-hours during 1957 without a lost-time accident. The record of safe operation, however, outdistances this by far—exceeding three years and 3,000,000 man-hours.

The Edward Benton Fritz Memorial Trophy is presented annually by Fritz Publications Inc., publisher of THE PAPER INDUSTRY, *to that mill which in the opinion of the judges has made the most outstanding record during the preceding contest year.*

Understandable pride

It is with understandable pride that the men and women at Octonto Falls point to their splendid plant safety record. It is a record that did not "just happen". It was built on the cooperation of considerate people who did everything possible to prevent accidents and who were (and are) well aware that accident-free years can result only if each day is devoid of lost-time injury.

Explaining the plant's award-winning record, G. L. Heath, vice president and plant manager, had this to say:

"When a group has made such an achievement, safety consciousness becomes almost self-sustaining. We do not imply that any activity of the safety program can be complacently

G. W. Heath, vice president and plant manager, is in over-all charge of safety at Falls Paper & Power.

Patrick Jones, first safety manager, is now in charge of traffic and stores operations.

Miss Dorothy Funk, plant nurse, and Leonard Warner, personnel manager, discuss a first aid treatment report. Miss Funk is a registered nurse.

Ernest Winski (r), finishing engineer and a safety committee chairman, discusses an accident-prevention problem with Paul Marsden, pulp mill superintendent.

relaxed or abandoned. But it *does* seem that a receptive atmosphere grows and grows . . . ."

It is obvious that success came only after a lot of hard work. The organized safety campaign at Falls Paper & Power is relatively recent. It was in 1952 that Patrick Jones was given major responsibility to establish such a program. That program was patterned after those already in existence in other Scott mills:

1. Create a feeling of safety responsibility in all supervisors.
2. Establish employee committees for inspection, suggestion and participation.
3. Give training in safe job habits.
4. Provide mechanical safeguards.
5. Set up housekeeping inspections and standards.
6. Dramatize safety through promotional material.
7. Carefully measure the progress of the program.
8. Investigate, report and publicize injuries or "close calls".
9. Give recognition to and publicize achievement.

These elements are quite ordinary in industry today. So much so, in fact, that super-human ingenuity is required to give freshness and color to the time-worn message.

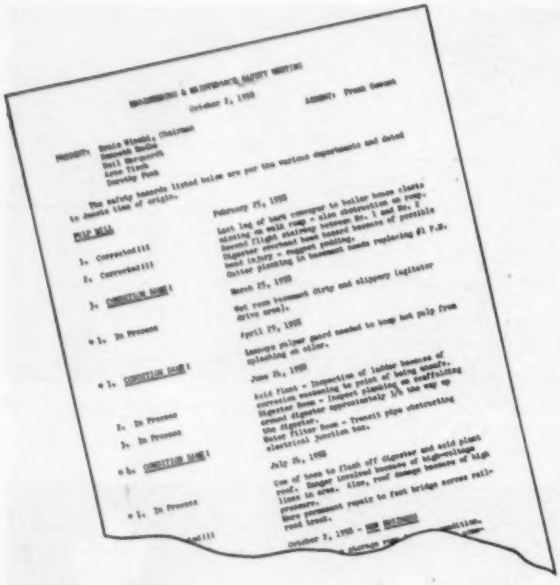
It was the good fortune of Falls Paper & Power to "see the usual initial success balloon into an enviable record". This view was recently expressed by Heath, who went on to say that, "almost everyone who has seriously begun a safety program achieves remarkable initial reduction in both the frequency rate and in injury severity. Most safety programs are today the result of gradual evolution through years of experience. What might have resulted 20 years ago", he asks, "if all industry could have suddenly and in full force applied the more highly-developed methods of today? It was our good fortune to have and apply a fully-developed pattern."

Genuine responsibility

When "Pat" Jones assumed responsibility for the safety program at Oconto Falls, the employees were gravely concerned over the 23 lost-time accidents that had occurred during 1951, and they had a deep determination to improve the safety picture. Any injury assumed an added significance from a personal viewpoint. This by virtue of a closely-knit plant family and plant community.

Jones' third—and real—asset was the benefit of reviewing sound safety programs that had been instituted in other Scott plants. This lightened the load considerably. He was able to adapt many sound safety practices and polices to the particular needs of his own plant.

The resulting program was designed in general to create a genuine feeling of safety responsibility among supervisors and to train all employees to cultivate safe job habits. It provided for the installation of mechanical safeguards; it established regular housekeeping standards and inspections; it instigated accident investigations; it publicized lost-time injuries and close calls alike in order to get the safety message home to every man, and—above all—*it provided recognition to all those con-*



Example of a safety meeting report at Falls Paper & Power.
All starred (*) items will not be listed again unless the condition warrants.

Commemorating an accident-free year, representatives of Falls Paper & Power receive recognition at a Chester, Pa. safety banquet.*

Typical recognition banquet sponsored by the Oconto Falls, Wis. papermaker after an injury-free year.

cerned in outstanding achievement and progress.

Almost concurrently with the institution of a safety program, a First Aid & Medical Department was established under the direction of Miss Dorothy Funk, R. N. Today, this service remains invaluable—both in safety administration and in the determination of the physical fitness and capabilities of employees. In a nutshell, the department sums up and interprets the cause of minor injuries. The full knowledge of minor injuries—their causes and effects—goes a long way toward the prevention of major accidents.

Changing emphasis

While an over-all pattern for safety may be followed, according to Vice President Heath, each facet of local conditions must be considered in setting up an accident-prevention program. "At our plant", he explains, "emphasis has changed several times over the years. At the start the lack of safety guards left the employees subject to unreasonable exposure. Then, as new operations were started, the training of supervisors and personnel became urgent. Next, for the long pull we needed fuller committee participation and responsibility to provide and assure a broader base and continuity".

For the past several years the personnel department at Falls Paper & Power has assumed the over-all responsibility for the administrative direction and medical services necessary to sustain an active safety program. Otherwise, the major burden has been transferred to and established in the various operating departments. The personnel of these departments is charged with the safety of the workman and the condition of machinery. To help carry this responsibility, department heads can depend on committees composed of supervisors and their men.

And today Falls Paper & Power has built a remarkable history of injury reduction:

Year	Lost-Time Injuries	Days Lost	Frequency	Severity
1951	23	6402	31.6	8.79
1952	3	690	4.07	.94
1953	0	0	0	0
1954	4	788	5.15	1.02
1955	2	404	2.44	493.8*
1956	0	0	0	0
1957	0	0	0	0
1958†*	0	0	0	0

*In 1955 the basis for the measurement of severity was changed from 1000 man-hours to correspond with the standard measurement for frequency.

†Estimate—January 1 to October 1.

Heath, as plant manager, closely follows the progress of these various committees and takes an active part in all safety proceedings — including accident investigations. His own standing committee is composed of representatives of every arm of plant operations.

A receptive attitude

As in the case of many other older mills, Heath explains, constant effort and attention is required even now to keep ahead. History shows that improved safety performance does not wait for mechanical perfection. This can be attributed only to the impact of the program and to a receptive attitude on the part of all concerned.

In summary Heath had this to say: "Our mill community, Oconto Falls, is as compact and friendly as the mill organization. Personal loss for injury stands out in the whole community and is of deep concern. In such an atmosphere it can be easy to obtain effective cooperation.

"Industry is becoming aware that measurement based on injury experience alone can lead to false confidence. We believe in the ability of our mill to continue its exceptionally favorable injury experience; but we are at the same time searching for ways of reducing accident exposure that will have as strong an impact today as did the Scott Paper safety program at 'the Falls' in 1952."

*From left to right: Lawrence Smith and Robert Metzner, members of the Falls Paper & Power safety committee; R. C. Mateer, Scott executive vice president (now retired); Miss Dorothy Funk, Norman Baldwin, Leonard Durocher and Marvin Black, also committee members.

Adhesives in the paper industry

Part 1 — Economics and technical achievements

Adhesives are an integral part of a package. Apart from holding the package together, they insure efficient and economical processing of packages at high speeds. They are used in the manufacture of corrugated board, laminated and coated papers. Large quantities of animal glues are used for sizing, flocculation and water treatment.

SINCE THE BEGINNING of time man has been faced with the necessity of causing two surfaces to adhere. One may conjecture that our early relatives considered saliva a very important commodity for this purpose. Mud must undoubtedly have run a very close second. Thus, the adhesives industry has its roots in antiquity.

As man advanced and as his ingenuity differentiated him from the animals around him, he probably added to his store of adhesives certain naturally occurring resins, rosin, bituminous earth, fish residues and beeswax (1). Certainly, by 5000 or 6000 years ago the art of adhesion and the closely related craft of coatings formulation was well developed among ancient peoples like the Egyptians and the Babylonians, A mummy case in any museum today attests to the fact that the Egyptians were capable of compounding very decorative coatings that have obvious protective value and that still adhere to their substrates with amazing tenacity. The veneers on the mummy cases are also an indication of the high level to which the art of adhesives gluing had been developed in ancient Egypt.

Even prior to the Egyptians, however, prehistoric people were using rosin to mend pottery, as archaeologists have shown. And crude types of cements served to bond together the various parts of their weapons. Certainly, the concept of mortar was well established during the Greek and Roman eras, and Braude (1) points out that the Goths some 2000 years ago decorated small oak boxes with Roman coins. So efficient was the adhesive they used that the coins still stick firmly to what remains of the rotted wood. Glues were available to the mural painters of Pompeii, and these murals were well preserved after 2000 years, thanks to the protective adhesive layer that covered them. These appear to have been animal glues, although combinations of cheese and lime were also used. These latter materials obviously are the forerunners of the large and important modern casein glue industry.

Undoubtedly, the "adhesives technologist" of prehistoric times must eventually have become dissatisfied with his fish residues and his muds. Thereupon, he must have used his rather limited ingenuity—spurred by his dissatisfaction with the available products—to develop better fish glues and more adhesive varieties of mud. This dissatisfaction with the *status quo* reflects itself from prehistoric times until the present. The net result of it is that in modern life we use adhesives for purposes as widely divergent as sealing an envelope or causing metal to adhere with such strength of bond that rivets may actually be eliminated in certain types of aircraft.

Economics

The extent to which modern man depends on adhesives is reflected in the fact that there is scarcely one large industry that in some important way or another does not use adhesives. And, certainly, the virtue of adhesives in everyday living can be emphasized by imagining what would happen if the familiar tube of paste, the jar of rubber glue or the Duco cement were suddenly made unavailable.

The adhesive industry is so diverse that production figures are difficult to obtain. Many of the products are relatively new, and a great deal of the information that would make possible accurate production figures is confidential. The following is representative of the meager data that are available. According to the "Modern Packaging Encyclopedia" for 1958 (8) (p. 201), the cost of packaging adhesives consumed in 1954 amounted to $94,400,000. By 1955 this figure increased to $104,600,000; and in 1956 the packaging industry used $109,200,000 worth of adhesives.

U. S. Tariff Commission figures indicate that in 1945 approximately 30,400,000 lb. of urea and melamine resins were produced for adhesives. The corresponding figure for phenolic resin adhesives in that year was 14,300,000. In 1955 approximately 128,000,000 lb. of urea and melamine resins were produced and 72,400,000 lb. of phenolics. Vinyls, largely of the polyvinyl acetate type, were produced for adhesive uses to the extent of 35,600,000 lb. in 1955 and 41,700,000 lb. in 1956.

The Tariff Commission's figures for 1944 indicate that approximately 26,200,000 lb. of "cyclic synthetic plastics" were consumed for adhesives, while 56,100,000 lb. of "acyclic" materials were consumed during the same year. The classifications such as "cyclic" and "acyclic" plastics are, of course, not highly definitive.

Table I

Glossary

1. Adherent	The surface or material to which an adhesive sticks or bonds.
2. Adhesion	The sticking together of substances that are in contact with each other. In describing adhesive bond failure, an adhesive break is one where relatively equal portions of the bonding layer can be found on each of the bonded substrates. A cohesive break, on the other hand, is one where all of the bonding material is either on one or the other of the bonded surfaces. Thus, adhesion is generally referred to as the force that the bonding material exerts towards the surfaces that it bonds together; whereas cohesion is generally regarded as the force inherent in the bonding material itself.
3. Adhesive	A material that causes two surfaces to stick together either loosely or firmly. Included under the generic term of adhesive are cements, pastes, glues, mucilages, plastic bonding agents, gums, etc. The usage of these terms is generally quite loose, and there is little agreement about the distinction between them.
4. Blocking	The property of adhesive sticking. The term is usually applied to a non-activated adhesive layer that inadvertently sticks to a surface with which it comes into contact because of excess humidity, pressure, etc. Thus, blocking has come to mean uncontrolled adhesion and is generally undesirable.
5. Bond	The act of causing two surfaces to adhere. Also, then, the final result of this operation is referred to as a bond.
6. Cement	(a) Ground lime used for mortar that hardens when hydrated. (b) A solution of an adhesive in a base or carrier such as the rubber cements or dental cements. By inference, one assumes that a cement undergoes some sort of chemical change after it is applied in order to effect hardening, although this, of course, is not always the case.
7. Chemically reactive adhesives	Adhesives that owe their adhesive strength after application to chemical reactions such as polymerization or cross-linking.
8. Contact pressure	The normal pressure that results when two surfaces come in contact without any other external force.
9. Delayed tack	The characteristic property of an adhesive that becomes tacky on the application of heat and maintains this tack after the adhesive has cooled. The unactivated adhesive may consist of a mixture of resin and plasticizer as discrete entities. Under the influence of heat, the two materials dissolve, and the plasticizer then exerts a tackifying effect on the resin, regardless of temperature.
10. Dextrin	Starch whose molecular weight has been decreased by a degradation process such as heat or chemical hydrolysis.
11. Glue	The protein extracts from materials such as fish, bones, animal offal, etc. Since such adhesives find wide application in the furniture and plywood industry, glue has become a generic term for all of the adhesives used in these and related industries. The phenolic, urea and casein-formaldehyde bonding agents, which are of course resins or plastics, are frequently referred to as glues.
12. Glue line	The actual area (or volume) occupied by the adhesive itself.
13. Gums	Carbohydrate materials of high molecular weight, usually from vegetable sources, that have adhesive characteristics.
14. Heat-seal adhesive	A type of adhesive that is non-tacky at ordinary temperatures, but which becomes sufficiently tacky by the application of heat so that a bond is readily formed.
15. Hot-melt	A descriptive term for an adhesive or coating that has sufficiently low viscosity in its melted state that it may be applied in a thin film as a melt.
16. Mucilage	Vegetable-based adhesives similar to gums.
17. Organic adhesive	An organic material that produces a practically permanent union between two or more surfaces. Included in the large hierarchy of organic adhesives are synthetic resins and rubbers, proteins, vegetable gums and cellulosic materials including starches. Excluded are the inorganic adhesives such as the silicates.
18. Paste	An adhesive that, by popular usage, is used for labels, stamps and paper products of all sorts. It is normally based on starch or dextrin.
19. Pressure-sensitive adhesive	A tacky or sticky adhesive usually supported on a strip of paper or plastic film that will adhere to a surface on the application of mild pressure at room temperature.
20. Shear	A stress applied to an adhesive bond in such a way that the two bonded surfaces slide in a direction parallel to their plane of contact.
21. Solvent-activated adhesive	An adhesive that becomes tacky in the presence of a solvent (including water). Gums, starches, many protein adhesives and some resin adhesives are in this category.
22. Starch	A carbohydrate of high molecular weight occurring in such plants as wheat, corn, potatoes, cassava, etc.
23. Stickiness	A characteristic of certain materials that wet surfaces. These substances have sufficiently high consistency or viscosity so that they resist deformation as demonstrated by a marked tendency to adhere or "stick" to an agent (e.g. finger) that is trying to effect deformation.
24. Substrate	A supporting medium for an adhesive or coating.
25. Tack	A more technical term of stickiness. Tack is generally considered to be the property of matter that makes it possible for surfaces to become joined on contact or on the application of pressure.
26. Tackifier	A chemical substance such as rosin or certain rosin derivatives that imparts stickiness or tackiness to non-sticky materials.
27. Tensile strength	Resistance of an adhesive bond to longitudinal stress.
28. Wetting	The phenomenon in which a film makes contact with the substrate. Polar materials (for example, chemical materials with hydroxyl, amine or carboxyl groups) generally have good wetting properties. Wetting is considered a prerequisite for adhesion.

In 1945 the War Production Board (ref. 2, Vol. 1, p. 191) estimated that 18,000,000 lb. per year of reclaimed rubber was consumed in pressure-sensitive adhesives.

Tariff Commission figures indicate further that approximately 105,000,000 lb. of animal glues were produced in 1937-38. Correspondingly, 209,000,000 lb. of non-animal glues were produced in the period 1937-39.

The Census of Manufacturer's Bulletin for 1954 indicates that in that year there were 213 establishments concerned with the manufacture of glues and adhesives as compared to 64 such businesses in 1939. These 213 companies employed 5147 workers, of which approximately 70 per cent were production workers. They used over $58,000,000 worth of raw materials, and the value of their shipments was $106,000,000. Undoubtedly, however, these figures provide only a partial overview of the adhesives industry.

That adhesives are only a very minor portion of the cost of the articles of which they are a constituent is indicated by some statistics from the packaging industry. Needless to say, adhesives are an integral part of a package, and without them packaging would be hard-pressed to fulfill even a small portion of the function it now performs. The per capita expenditure on packaging in the United States amounts currently to $88.00. In terms of paper and paperboard, packaging consumes 18,000,000 tons of products per year or 55 per cent of the output of the paper industry. When one considers that virtually all of this packaging is held together by adhesives, one realizes that the intrinsic value of the adhesive far exceeds its actual worth in dollars and cents. For the proper type of adhesive makes possible a secure and highly functional package. In addition, it insures efficient processing, which assures the formation of packages at a high rate of speed and with economy and savings that are subsequently passed on to the customer.

It has been pointed out (ref. 2, Vol. 1, p. 191) that nine adhesives are present in a package of cigarettes. Two of these are used in the product, and the remainder are used in the package. In a cigarette itself the seam is sealed either with a starch or casein glue. Moisture resistance is an important factor here. A second adhesive is used in filter tip cigarettes to attach the cork or filter tip to the cigarette paper. A resin emulsion is normally used here because such properties as moisture resistance, flexibility, good wet tack and moderate setting speed are important. In the package itself an adhesive is used to seal the cellophane. The adhesive here is the coating on the cellophane, which is usually nitrocellulose. The nitrocellulose may be activated either by heat or solvent. In the flip-type package a resin emulsion adhesive that has high tack and fast set is used to seal the box. The foil and paper lining of the package is laminated with a combination of converted starch and sodium silicate. The revenue stamp is attached with a dextrin adhesive that has high tack and moderate setting speed. The remaining three adhesives associated with packaging are used to form and seal the cartons, to close the shipping cases, and to attach the shipping labels.

Technical achievements

The adhesive industry, by any standard, is highly developed from a technological point of view. This point is readily emphasized by the homely example of a sealed envelope. This example becomes much less commonplace when one realizes that an adhesive for an envelope must be formulated so that it will liquefy and develop tack instantly when it comes in contact with water. The concentration of the water certainly is not controlled and varies markedly, of course, within certain obvious limits. Even so, the tack developed must be sufficient to bond paper instantaneously. And all of this must take place regardless of temperature. In addition, the adhesive layer prior to activation must not block, regardless of humidity.

The example of the sealed envelope can be expanded to the much more dramatic example of the rivet-free plane developed during World War II. Here the rivets were found to interfere with the plane's performance. Modern adhesives technology made possible the formation of strong bonds between the metal parts of the planes by putting to work some of the same basic theory used in sealing an envelope.

An even more dramatic example recently reported is the use of an adhesive in repairing bone fractures without the aid of either nails or splints.

Anyone involved in the paper industry is well aware of the role that adhesives play in contributing to the success of what is now the fifth largest industry in the United States. As has already been indicated, in the field of packaging adhesives are of the utmost importance. And many of the advances of modern packaging technology depend upon adhesives that can be applied by machines rather than by hand, that develop tack at the required moment, and that demonstrate high tensile or adhesive strength immediately upon application. The modern adhesive for the packaging industry must be stable over a wide range of temperatures—including the arctic cold simulated by a modern food freezer and the high humidity and heat that exists in many parts of our country and throughout the world. It must be stable through a broad range of humidity variations. And, perhaps most demanding of all, it must stick to the wide variety of surfaces now employed by the packaging industry. These include not only the cellulosic materials, but a variety of foils and plastic films such as cellophane, cellulose acetate, Saran, vinyl, Mylar and even nylon.

From this very brief discussion, one can see that adhesives for the packaging industry can result only after the investment of a great deal of time, money and research.

But the packaging and envelope fields already mentioned are not the only branches of the paper industry that require adhesives. The area of pressure-sensitive adhesives is an industry in itself. Similarly, heat-seal adhesives, which as a class include "delayed-tack" adhesives, are used not only for packaging and labeling, but for bag manufacture, the application of certain types of tapes and a variety of other uses. Also, the label industry, although it depends to a degree on heat-seal adhesives, still requires a wide variety of glues, pastes and other wet adhesives. The corrugated board industry, the laminated paper field, paper impregnating operations and bookbinding, etc. all are areas where adhesives are basic to the success of the final operation.

Adhesives are used as binding agents in paper coatings. The latter are fully described in "Technology of Paper Coating".*

The "on-machine" coatings placed on paper are basically starch or protein adhesives. And in the manufacture of paper, glues, starches and resinous types of adhesives such as the melamine or urea resins are frequently included in order to impart properties such as size and wet strength. The rosin frequently employed in paper manufacture is, of course, an adhesive, as are the wide variety of sizing materials common to the industry.

The principal uses of large quantities of animal glues in papermaking today are those of surface and internal sizing, chemical flocculants for retention and stock recovery, and raw and waste water treatment.

*H. Wittcoff and A. W. J. Dyck. Published by Fritz Publications Inc.

Standard cost accounting for paper mills

EDWARD W. ROGERS, Partner
Cassel, Groneweg, Rohlfing & Clark

Part I — Standard cost methods to achieve cost control

▶ The standard cost method involves (1) comprehensive and detailed planning and forecasting and (2) application of the exception principle.

STANDARD COST accounting methods and procedures have attained such universal acceptance in all types of industries that there is no longer any real controversy as to whether standard cost methods can be used in any particular manufacturing company. The fundamental soundness of the standard cost approach has been demonstrated thoroughly for more than 30 years.

What are standard cost methods?

The word "standard" has a wide variety of meanings and will be understood in many different ways, depending upon who uses it, who hears it and to what it is applied. Our understanding of standard cost methods and our use of the term in this article is consistent with this definition:

> **Standard cost method—an accounting plan that compares actual net profits with predicted net profits based on computation of the standard cost of production, budgets of expense and budgets of sales volume; with analyses of variations from the predicted results, by their causes. (L. P. Alford, "Cost and Production Handbook")**

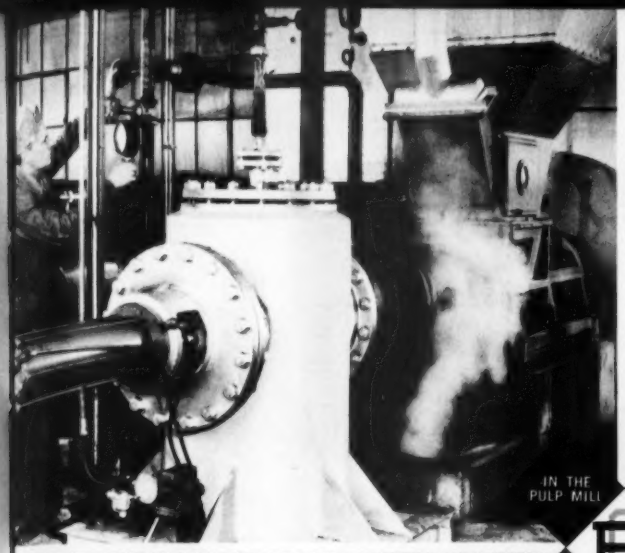
The standard cost method has two fundamental elements. The first is comprehensive and detailed planning and forecasting, the second the application of the "exception principle". That principle is based on the belief that, "Managerial efficiency is greatly increased by concentrating managerial attention solely upon those executive matters which are variations (exceptions) from routine, plan or standard." If management attention is to be directed principally at the "exceptions", or variances, two things are needed: (a) comprehensive and detailed standards or budgets for all operations and functions; (b) an organized method of comparing the standards with actual performance, of determining the causes of the variances, and of calculating the amount of variance that is due to each cause. If standard cost methods are to be understood, they must be considered as carefully-organized procedures for effecting "management by exceptions"; these procedures, as a valuable additional benefit, also provide precise information as to the costs of individual products.

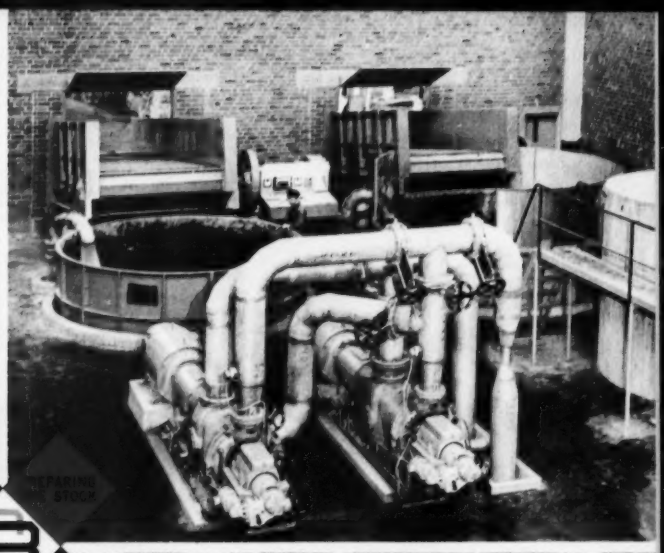
It is important to recognize that standard cost methods have changed the emphasis of cost accounting procedures and have added a new dimension of usefulness to cost accounting records. Traditional cost accounting methods have concentrated on cost finding; that is, on determining what was the cost of each product. Standard cost methods concentrate on cost control; that is, on determining what costs are abnormal or excessive and what caused the excessive costs, so that those excessive costs can be reduced or eliminated.

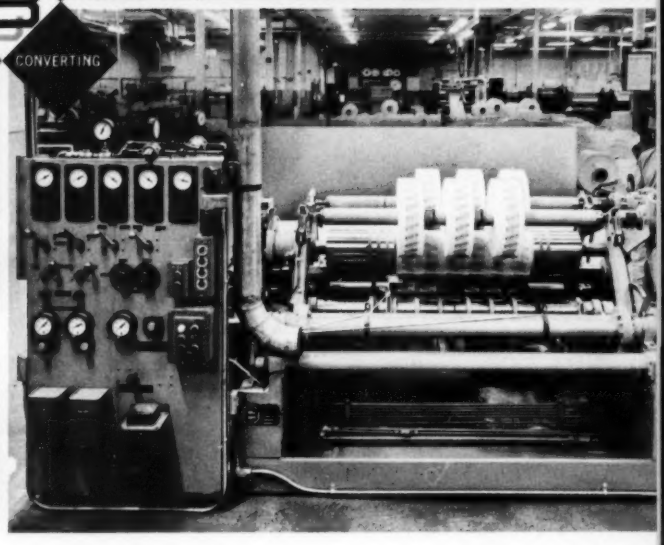
Deficiencies of historical cost accounting

The older, traditional cost accounting methods were principally designed to determine the cost of particular products; the emphasis was on the assignment or allocation of all costs and expenses to all products. Since the product cost figures reflected all costs, any amounts due to gross inefficiencies, or due to drastic changes in volume or to clerical or reporting errors were also spread over the cost of the individual products. Unit product costs were thus distorted and perverted; unless very carefully analyzed, they were often very misleading. By these "historical" cost methods (often erroneously called "actual" costs), accountants were able to calculate product cost figures that were useful for determination of inventory values, and for determination of the cost of goods sold. The historical cost methods produced product cost figures that satisfied the needs of the accountant but did very little to satisfy the needs of the manager.

Any manager who attempted to use such product cost figures was quickly and thoroughly confused, and if he persisted in studying the figures he was soon overwhelmed by an immense quantity of detailed figures that seemed to point in several directions at once. If there are comparatively few different products produced, and each lot of each product involves considerable cost and expense, small errors or distortions may not be significant, so that the unit costs are fairly stable and reasonably reliable—at least when operating levels are fairly stable, when schedules are steady







In Every Paper-Making Process . . . BLACK-CLAWSON is There

. . . giving engineering assistance at every point

Through its four specialized manufacturing divisions, Black-Clawson provides sound engineering assistance at every point in the paper-making process, from the pulp mill to the converting line.

Only a multi-division organization, with the largest, most talented group of paper mill machinery engineers in the world, can offer complete service, work with a mill or converter on any engineering problem that may come up, on any grade from tisssue to board.

Black-Clawson coordinated engineering has served the pulp and paper industry for over 100 years and will help fashion the paper products of the future.

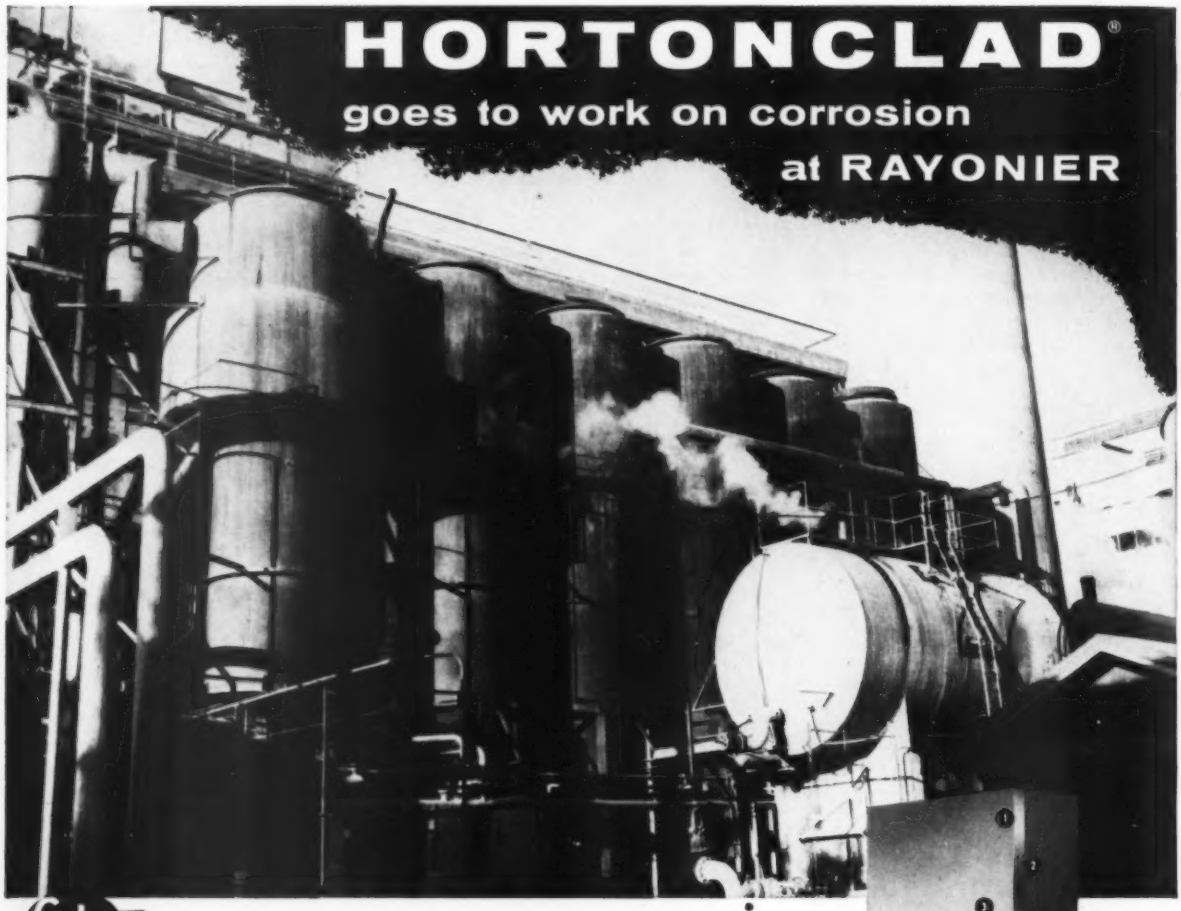
PANDIA DIVISION PULP MILL EQUIPMENT

DILTS DIVISION CONVERTING MACHINERY

THE BLACK-CLAWSON COMPANY

Executive Offices: 250 Park Ave., New York, N. Y.
Plants: Middletown, Ohio, Hamilton, Ohio, Watertown, N.Y., Fulton, N.Y.
Black-Clawson (Canada) Ltd., Montreal, P.Q.
Black-Clawson International Ltd., London, England

HORTONCLAD®
goes to work on corrosion at RAYONIER

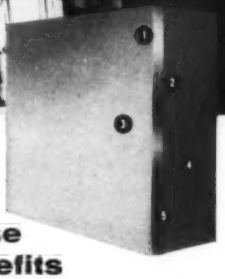


CB&I—built EVAPORATOR handles foam problem on black sulfate liquor

The corrosion-resistant properties of Hortonclad® were employed in the building of this six-body, sextuple effect Conkey® evaporator designed, fabricated and erected by CB&I for the Jesup, Georgia plant of Rayonier, Inc. Stainless steel Hortonclad was used for the No. 1 and No. 2 body, where protection from a high foaming type of sulfate black liquor was most needed. Structures were furnished through Ebasco Services, Inc.

Hortonclad, a CB&I composite metal having an integral and continuous bond, is an example of how CB&I's continuing program of *applied metallurgy* in steel plate construction is helping *us*—to help industry leaders attain better and longer performance life from storage and process vessels.

Write your nearest CB&I office for a copy of a bulletin which describes the extensive *co-ordinated* services and equipment which we furnish for the paper and pulp mill industry.



these benefits with HORTONCLAD

1. Uniform Thickness
2. High Strength Bond
3. Clean, Contaminant-Free Surface
4. Adaptability to Any Size or Shape
5. Special Combinations of Metals

Photo above: Compact unitized, "out-of-door" construction such as this, is typical of the way CB&I-built Conkey evaporators help insure low installation and erection costs and maximum use of space.

CB&I-built Conkey equipment includes:
Crystallizers • Evaporators • Filters

PP27

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston • Kansas City (Mo.)
New Orleans • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • South Pasadena • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, GREENVILLE, PA. and at NEW CASTLE, DELAWARE.

and efficiency is fairly high. By studying the figures the manager could tell if the lot size was normal, and he would know if overall plant operations were somewhere near normal levels; but the cost figures might conceal many other distortions that were, for practical purposes, unmeasurable.

This problem seemed most troublesome in industries where the cost accounting was done on a job-order basis, but industries that used process cost techniques were not much better off. In papermaking operations, where process cost methods are often used, there are several factors that regularly distort historical cost figures. In a paper mill abnormal downtime does not occur a little bit at a time, thus slightly affecting the time required for several different lots of paper. Instead, the abnormal downtime will cause a large increase in the time required for one or two lots of paper and will not affect the time required to run other lots. If the downtime occurred because of the characteristics of the particular grade being run (such as color matching, for instance), the cost of the downtime should be reflected in the cost of that grade. Much more often, abnormal downtime occurs as a result of conditions or situations that have nothing to do with the grade of paper being produced on the machine. In most cases, the abnormal downtime results from failures of machines or men that are just as likely to happen with one grade as another.

This point may be quite obvious to those familiar with papermaking operations, but it is so important that it deserves further emphasis. If the calculation of the cost of a lot of paper is based on the machine time actually required to run that lot, the costs will frequently fluctuate widely from one lot to another. If a lot of a particular grade is run each month and normally requires 10 hours of machine time, the mill may have "good luck" on the runs for six months in a row, so that the apparent cost of the grade is moderate, and there is a satisfactory profit margin. If on the run during the seventh month a wire breaks and causes two hours of downtime, that run will require 12 hours of machine time instead of the normal 10 hours. If that running time is translated into terms of costs, that particular grade appears to be quite expensive, the profit margin on that grade appears to be unsatisfactory, and it has ceased to be a desirable product of the mill. Actually, we know that the wire did not break because we were running that particular grade; the wire break and the resultant downtime just happened to occur at that particular time. Such occurrences certainly affect the total cost of all paper produced, but the cost should be spread, in some fashion, over the costs of all lots or grades and should not be allowed to distort the costs of only one or two grades or lots of paper.

Obviously, if we use historical costs in the manner described and furnish such costs to the managers for their information and guidance, the managers must accept some ridiculous conclusions or must alternately conclude that the cost figures are unreliable and unusable.

How product cost figures are used

A manager who tries to use his cost figures for comparing the profit margins of the different grades and lots will also try to use those cost figures as a basis for bid prices on special lots, or for determining what price concessions he can afford in competitive situations. The historical costs are not too helpful for this purpose either, even if they contain none of the distortions mentioned above, unless the manager assumes that past experience accurately reflects all of the conditions that may be expected in the future. In most cases that assumption is not sound, and the manager knows that different operating conditions can be expected, and he must search for ways to measure what differences in costs will result from the different conditions. If the manager is thoroughly acquainted with the machinations of the cost accounting procedures, he may try to find a unit cost figure that has been developed on a lot that is about the same size as the lot he wants to bid on. That brings him a little closer to a significant figure, but he must also determine whether he can expect operating conditions in the future to be comparable to the conditions that prevailed when that earlier lot was run. That is not easy; he must consider the over-all production volume in the mill during the earlier period, the expenses incurred during that period, the degree of "absorption" of overhead expenses, statistics covering broke or shrinkage and many other factors. Few people have the knowledge or skill to make all the necessary calculations, and the manager certainly should not have to try to do so. He has a right to look to his accountant for figures that he can safely use for forecasting costs; it is much more important to know approximately what costs will be than to know, with great precision, what costs were.

We have discussed the inadequacies of traditional "historical" cost accounting methods when used for cost finding; for many purposes the product costs established by such methods are misleading and otherwise unsatisfactory. However, as far as the accountant is concerned the historical cost accounting procedures do an adequate job of cost finding (valuing inventories and determining the cost of goods sold). We have also concluded that these product cost figures are so erratic that they are virtually useless as far as the manager is concerned. Earlier, we have also stated that standard cost methods provide precise information as to the costs of individual products, although the cost finding function is not the primary purpose of standard cost methods. Further, we can state very firmly that the product cost figures based on standard cost methods are satisfactory for accounting purposes and are also very useful for all management decisions as to pricing, bidding or comparison of profit margins by product lines or grades.

The prime goal — cost control

We have concluded that standard cost methods are much superior to the historical cost methods as far as cost finding is concerned; standard cost methods are also uniquely effective for the function of forecasting costs and profits, and standard costs superbly perform a third function, which is by far the most important: cost control.

Modern management has accepted the importance of "management by exceptions" and has also accepted the need for procedures that will determine which exceptions from standard deserve the attention of the manager. Standard cost methods automatically bring to the manager's attention any sizeable variances and, if the variances are adequately analyzed, will indicate the causes of each variance item. With such information the manager can quickly determine what needs his attention and how badly his attention is needed. Further, as steps are taken to correct the causes of variances, the manager is able to measure his progress in correcting the unsatisfactory conditions.

We are discussing a very simple principle, but that simplicity should not blind us to the very considerable complexity of the study, analysis and planning that are necessary to set up the standard cost procedures. The establishment of proper standards is also a very considerable task, both complicated and laborious, and requires a high degree of knowledge and judgment.

(To be concluded in the December issue.)

Supercalender drive at Eastman introduces new system

CHARLES D. BECK
Application Engineer
User Industry Sales
General Electric Co.

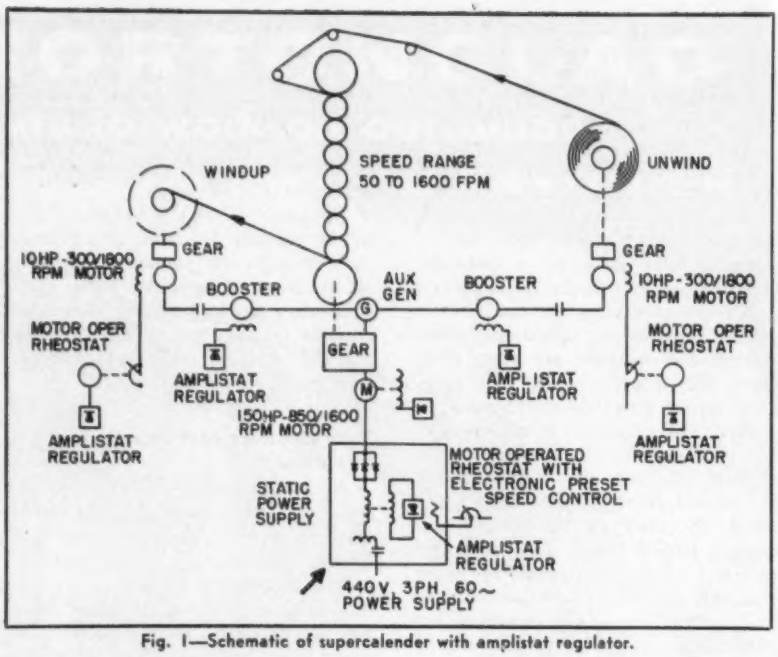


Fig. 1—Schematic of supercalender with amplistat regulator.

The drive includes a completely static power conversion unit with static speed regulator and static tension regulator. The wind and unwind drives are designed to provide accurate control of sheet tension with varying roll diameter.

THE PRESENT DAY manufacture of paper involves a greater use of supercalendering than ever before. With the exception of newsprint, practically all printing paper is supercalendered. This process is used to impart desirable surface qualities to the paper, such as gloss, compactness and moisture resistance.

Supercalendering, like most converting room processes, is usually a batch type operation, involving unwinding a previously wound roll of paper, passing it through the calender stack and rewinding it into a new roll. For this reason the operating efficiency of the supercalender is relatively low compared to the continuous operation of the paper machine proper with which the supercalender must keep pace. As paper machine and processing machine speeds increase and product quality requirements also rise, it becomes increasingly important that steps be taken to improve the operation of the supercalender so that it does not become a bottleneck in the paper production system. A major consideration, when striving to secure the maximum productivity from a supercalender, is the drive.

New features

The new General Electric Co. drive on a B. F. Perkins & Son Inc. supercalender* installed at Eastman Kodak Co.'s film department incorporates several new features and components that together represent a distinct advancement in the science of machine drives. The stack proper is driven through a silent chain drive by a 150-hp adjustable speed dc motor that provides full rated horsepower over the upper half of the design speed range. Thus, essentially constant horsepower characteristics are obtained for the higher operating speeds, while additional torque is available at the lower speeds where supercalendering at high nip pressures or with soft rolls may be encountered. This arrangement is also helpful in providing for the very low thread speed that is required of this drive.

The unwind and windup cores are center-driven by adjustable voltage dc drives uniquely arranged to provide accurate control of sheet tension over the supercalender operating speed range with varying roll diameter. Six amplistat regulators continuously control and synchronize the three motors (Fig. 1).

Static power conversion

The newest feature incorporated in this drive is a completely static power conversion unit for the 150-hp main motor. The static power unit supplies the 150-hp motor with controlled and regulated dc power from the mill 480-v, three-phase, 60-cycle bus. This type of system is often more descriptively referred to as a semi-conductor power unit because the rectification of the ac power to dc is accomplished by silicon rectifiers.

The semi-conductor adjustable speed drive provides comparable performance to that attainable with the familiar Ward-Leonard adjustable speed drives, which utilize a conventional motor generator set. The significant feature of the static power unit is the elimination of moving parts and the elimination of routine maintenance associated with rotating equipment.

The power conversion (ac to dc) is performed by a three-phase double-

*Described in the October 1958 issue of THE PAPER INDUSTRY.

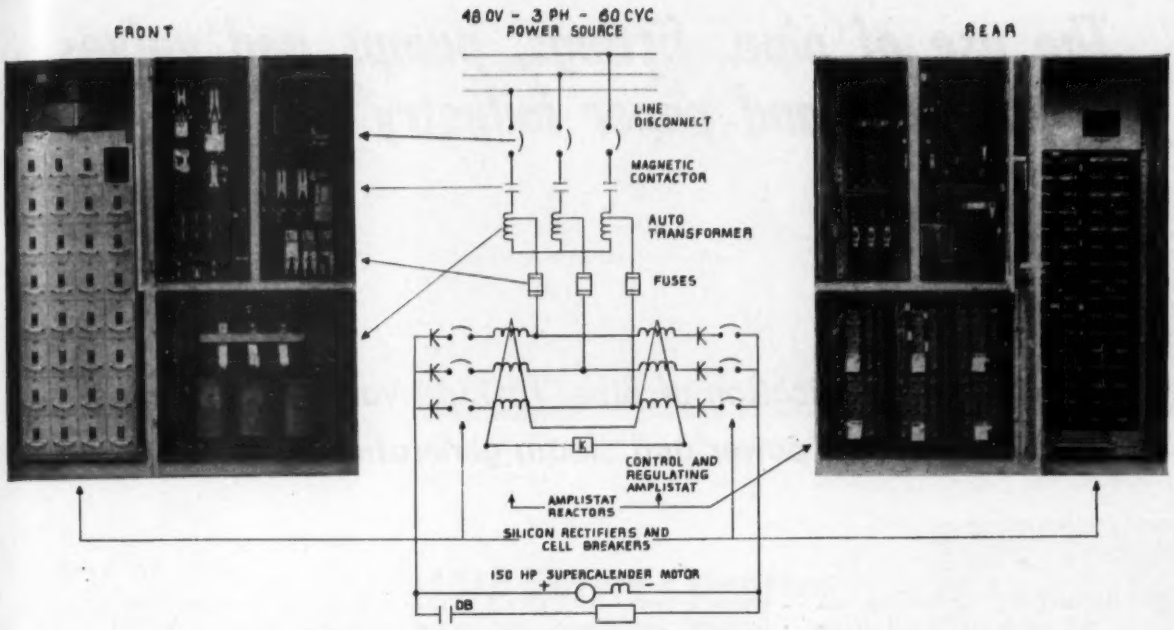


Fig. 2—Static power unit motor armature circuit and components.

way bridge rectifier employing hermetically-sealed silicon rectifiers. Control of the power unit output and the supercalender speed is accomplished by controllable amplistat reactors that, together with silicon rectifiers, form a magnetic amplifier similar in all respects (except size) to the familiar magnetic amplifier regulator so often found in industry today. An autotransformer reduces the 480-ac supply to a suitable lower voltage that, when rectified, provides rated voltage to the standard 240-v dc motor. Conventional amplistat speed regulators control the output of the static power supply and the field of the dc motor.

Details of the power circuitry and the static components are shown in Fig. 2. The silicon rectifier cells and the protective circuit breakers are mounted in draw-out units to simplify inspection and reduce the time required for servicing. Each rectifier shown in Fig. 2 represents 15 silicon cells, and every group of three cells is protected by an individual high-speed circuit breaker (see Fig. 3). Each drawer or plug-in assembly thus contains three silicon rectifier cells and the associated protective breaker. Spare drawers are provided in this instance as an added convenience feature.

Unwind and windup drives

Of primary importance in the design of the unwind and windup drives is the need for accurate control of sheet tension over the entire machine speed range and for all roll sizes. These electric drives are easier to operate, provide improved control of sheet tension over a wide speed and buildup range and require less attention from the operator as the roll changes in diameter. Specific features of the system are the ability to:

1. Operate over a wide range of motor currents.
2. Hold the set motor current regardless of sheet speed and windup roll diameter.
3. Provide good torque characteristics at standstill and at slow speeds.
4. Maintain the proper motor field strength so that actual motor torque (for a given motor current) is always essentially proportional to roll diameter.

The supercalender motor voltage is not proportional to sheet speed because part of the operating speed range of the main drive is obtained

(Continued on page 564)

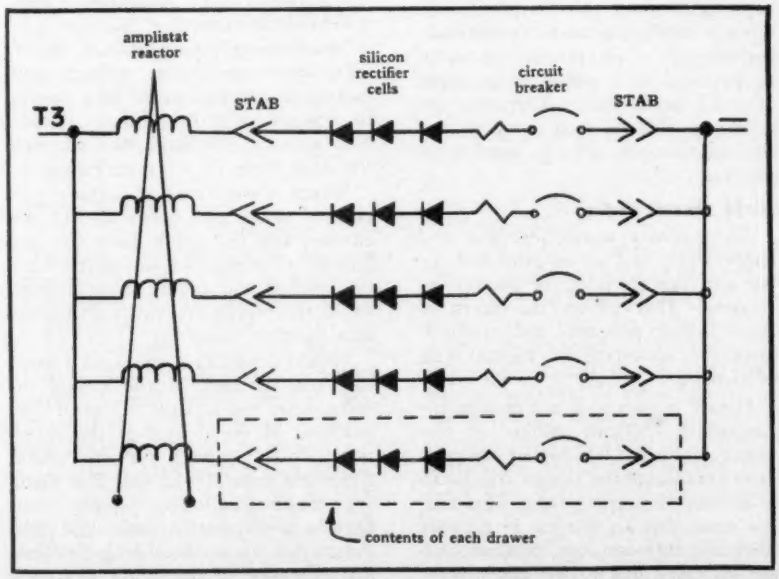


Fig. 3—Detailed circuitry represented by each of the six rectifier circuits shown in Fig. 2.

The use of pipe, fittings, pumps and valves in the pulp and paper industry

ROLAND L. ALLEN JR.
Vice President, Eastern Engineering Co.

Part VI — Application of pipe, fittings, valves and pumps in power and steam generation

THE HEART OF the modern integrated pulp and paper mill is the power plant. This portion of the mill is in service more continuously than any other with the possible exception of the water supply system.

A pulp and paper mill power plant is more complex than public utility power plants because it is assigned several roles. It must produce a large dependable supply of process steam at one or more pressures and temperatures; produce all or a portion of the process power requirements; recover chemicals from spent process liquors —and do so at a profitable return in power and steam generated and chemicals recovered, and dispose of wood refuse at an economic advantage.

The multiple role of the pulp and paper mill power plant requires more types of equipment and a larger number of pieces of equipment than would be required in a public utility plant of much larger rating. Therefore, the piping systems are more complex, and the number of piping services is greater.

Main steam system

The primary steam pressures and temperatures utilized in pulp and paper mill power cycles are steadily increasing. This allows the users of these higher pressures and temperatures the advantage of higher cycle efficiencies.

Higher pressures do not present any particularly difficult design or economic problems, but higher temperatures complicate the design and greatly increase the piping costs. This does not mean that an increase in pressure does not increase cost, because costs are increased due to the necessity of increasing the wall thickness of the piping to contain the higher pressures. Increased temperatures may require that the piping be made from a more expensive material, and this increase in cost is appreciable when the temperature passes 775°F and a material other than carbon steel must be used to withstand the service temperature.

The main steam temperatures of most new pulp and paper mill power plants are now in the 800-to-900°F range, with a few in the 900-to-1000° F range. Most of the plants built before the 1950s were for service temperatures of 750° F and below.

For service temperatures of 750° F and below carbon steel piping manufactured in accordance with ASTM A-106 is used. For higher temperatures alloy steel piping of one of the grades manufactured in accordance with ASTM A335 is used.

Main steam piping should be of all-welded construction without any flanged or screwed joints and should be designed and installed in accordance with the ASME Boiler Code and the ASA Code for Pressure Piping.

Where space allows, it is more economical to use pipe bends than to use elbows; and the bends have the additional advantages of having less friction to flow and adding more flexibility to the piping system to accommodate thermal expansion.

System flexibility is the most important consideration in the design of main steam piping and is also of importance in the design of the other power plant piping systems where temperatures of 200-to-300° F or more are encountered. The piping must have a configuration such that the stresses set up in the piping by thermal expansion of the piping and connected equipment are within allowable limits for the piping material and the thrusts transmitted by the piping to connected equipment do not cause excessive distortion or stress in the connected equipment.

The proper design and location of piping anchors and supports are necessary in order to achieve the desired flexibility of the piping configuration as designed.

Another construction consideration is the use of the welding procedures and stress relief and heat treatment procedures prescribed by the codes.

Valves for main steam service should be forged or cast carbon steel or alloy steel of the same analysis as the piping and should have stainless steel trim.

Boiler feedwater system

The high-pressure boiler feedwater system must be designed and constructed with the same care as the main steam system. However, the boiler feedwater system is not subjected to the high temperatures that are encountered in the main steam system and therefore may be constructed of carbon steel piping manufactured in accordance with ASTM A-106.

Like the main steam system, the boiler feedwater should be as free of flanged connections as possible. Flanged connections, in any piping that is subject to appreciable thermal expansion or hydraulic shock, tend to leak and are therefore a source of maintenance troubles. In fact, leaks at flanged joints in high-pressure steam piping are likely to erode the face of the flange to the extent that the flange must be replaced if the leak is not stopped fairly soon.

Boiler feed pumps must be de-

(Continued on page 570)

- Falls Paper & Power captures Edward Benton Fritz Memorial Trophy for outstanding safety achievement.
- Accident-prevention on a company-wide basis wins for Celotex the Arthur Hoyt Scott Award.
- Pulp & Paper Section boasts the lowest combined frequency rate recorded in 33 annual contests.
- Over-all Section frequency betters 1956 mark.
- Safety is hard to sell—and for no good reason.

1958-59 SECTION OFFICERS: R. G. Belknap, chairman; D. V. Hill, newsletter editor; George R. Merriman, vice chairman and program chairman, and V. P. Coulon, secretary and membership chairman.

46th Safety Congress Spotlights Falls Paper & Power, Celotex

ESTABLISHING a new record in the 33-year history of its safety contest, the Pulp & Paper Section of the National Safety Council has hailed its accomplishment.

The section met during the recent National Safety Congress at the Conrad Hilton Hotel in Chicago. It was there reported that the 578 contestants who finished the 1957 competition can boast the lowest combined frequency rate that has been reached in this industry in its record of 33 contests. This rate—excluding pulpwood logging—was 7.08, 1 per cent lower than in 1956.

The four-day session of the Pulp & Paper Section was attended by more than 150 mill safety experts from throughout the United States and Canada.

Falls Paper and Celotex win major awards

A highlight of the gathering was the presentation of the major awards for outstanding accomplishment in safety.

Winner of the 1957 Edward Benton Fritz Trophy was Falls Paper & Power Co. of Oconto Falls, Wis.

The Arthur Hoyt Scott Award for 1957 was won by Celotex Corp.

Belknap 1958-59 chairman

Elected chairman of the section for 1958-59 was R. G. Belknap, personnel manager for Bemis Bros. Bag Co. at East Pepperell, Mass. He succeeds Earl F. Ripstra, personnel manager for Container Corp. of America in Chicago.

Other principal officers named to serve for the coming year:

Vice Chairman and Program Chairman—George R. Merriman, coordinator of safety for the Southern Kraft Div. of International Paper Co., Mobile, Ala.; **Newsletter Editor**—D. V. Hill, safety director for Mead Corp., Kingsport, Tenn.; **Secretary and Membership Chairman**—V. P. Coulon, safety director for Sealright-Oswego Falls Corp., Fulton, N. Y.

Hard to sell

That the safety movement is too reluctant, too apologetic and too reticent was the view expressed by Paul Jones in addressing the annual luncheon of the section.

Jones, director of public information for the National Safety Council, declared that safety should brag more about its accomplishments and apologize less for its failures.

Safety is hard to sell, he said, and for no good reason. After all, it is merely a question of asking an individual not to kill himself.

Jones is by no means ashamed of the accomplishments of the organized safety movement. Had the accident frequency rate of 1913 continued through 1957, he explained, the toll of accidental death today would be nearing "astronomical" proportion. It has been estimated, in fact, that nearly 750,000 lives have been saved through the efforts of men dedicated to safety since the establishment of the National Safety Council in 1913.

Considerate cooperation

In winning the Fritz Trophy Falls Paper & Power, a subsidiary of Scott Paper Co., worked 771,762 safe man-hours through December 31, 1957. The Oconto Falls plant is an integrated operation producing sulfite pulp and paper, towels and household wax paper.

In presenting the award, A. Scott Dowd, president and general manager of Fritz Publications Inc., had this to say: "We are told that this splendid achievement did not 'just happen', but that it was built upon the cooperation of considerate people who did everything possible to prevent accidents, knowing that accident-free years can result only if each day is devoid of lost-time injury."

The perfect score that won for Falls Paper & Power the coveted Fritz award had its conception long

EDWARD BENTON Fritz Memorial Trophy is presented to G. L. Heath (l), vice president and plant manager at Falls Paper & Power Co., by A. Scott Dowd, president of Fritz Publications Inc.

CELOTEX CORP. wins the Arthur Hoyt Scott Award for over-all safety performance. At the left is W. L. Rodich of Celotex. Representing Scott Paper Co. is Claire L. Lyon.

KEYNOTING the annual luncheon of the Pulp & Paper Section is Paul Jones, director of public information for the National Safety Council.

RETIRING SECTION Chairman Earl F. Ripstra (l) is recognized for his contribution to mill safety. Presenting the plaque is Fred Soughton, a past chairman of the pulp and paper group.

before the 1957 contest year. Through December 1, 1957, the plant had worked a total of 2,333,417 safe man-hours since its last reportable injury.

Accepting the 1957 award for his firm was G. L. Heath, vice president and plant manager at Oconto Falls.

Donor of the trophy is THE PAPER INDUSTRY.

Not quite perfect

The fifth annual presentation of the Arthur Hoyt Scott Award was accepted for Celotex by W. L. Rodich, the firm's vice president in charge of operations. Representing the donor was Claire L. Lyon, manager of corporate employee relations for Scott Paper Co. at Chester, Pa.

The trophy is given each year to that company whose operations *in all its plants combined* result in the safety record considered by the contest judges to merit recognition.

Five Celotex plants recorded an accident frequency rate of 1.09 during the 1957 contest year. Setting its sights high, the company had established 1.00 as the 1957 goal. In his presentation remarks, Lyon noted that Celotex had missed its aim by less than 10 per cent. An outstanding achievement.

23rd among 40

The 1957 accident frequency rate of *all companies in the Pulp & Paper Section* reporting their experience to the National Safety Council was 7.15—slightly lower than in 1956. Among the 40 reporting industries, pulp and paper ranked 23rd.

This statistical report was presented by A. Scott Dowd, chairman of the contest committee.

A total of 578 contestants, he said, finished the 1957 competition with ranking positions. These consisted of 320 pulp and paper mills, 239 converting plants and 19 pulpwood logging units. The total exposure was 579,417,000 man-hours, nearly 9,000,000 more man-hours than were recorded in the 1956 contest. There were 5441 reported injuries—an increase of 16 per cent.

The cumulative rate of pulpwood logging was 78.52—an increase by identical units of 48 per cent compared with 1956.

Dowd further reported that 386 contestants (67 per cent of the total) had frequency rates of under 10, while 60 units consisting of 33 mills and 27 converting plants completed the competition with perfect scores.

A total of 140 contestants aside from group winners had frequency rates below their group averages and also showed reduction by compari-

son with their rates in the previous contest.

Learning by experience

"Safety is not a supplementary activity. It is an essential part of economic operation and should be considered on the same basis as quality and production."

L. A. Combs, vice president for industrial relations, Container Corp. of America, was scheduled to present the keynote address at the section's opening meeting. He was unable to attend, and an abstract of his remarks is presented here.

"Safe operation", Combs declared, "must be planned, and your plan should achieve that end. We must constantly be on the alert for new hazards and health problems, and we must learn from the experience of others."

One is too many

A 28-min. color film portrayed the safety achievement in the Pacific Coast pulp and paper industry. Depicted was a panorama of human feelings, the study and the effort that comprise a successful safety program.

The training film was brought to the Congress by George A. LaHusen, general safety supervisor for Crown Zellerbach Corp. at Portland, Ore. Production was under the supervision of the Pacific Coast Association of Pulp & Paper Manufacturers.

The theme of the motion picture was the way in which workmen, union officials, supervisors and safety specialists fit into the program.

A truer picture

Guest speaker O. C. Haier of Standard Oil Co. (Ohio) discussed his firm's safety program, in which, he said, can be found "a truer picture of the frequency rate".

The system records every injury—minor and disabling. And although the frequency rate proves to be greater than with the usual recording method, the company is better equipped to follow its safety program, its successes and its failures.

Formula for success

Thinking leads to feeling, feeling leads to action, action leads to habit, habit leads to formation of character, and formation of character leads to destiny.

"This is the formula used to obtain the correct attitude toward safety", according to Dr. J. M. Bosworth, division medical director for Liberty Mutual Insurance Co. at Atlanta, Ga.

"Watch the behavior in the individual employee. The wrong behavior is caused by negative thinking. This in turn leads to trouble. Guide the employee to the positive approach. When this is accomplished, the rest of the formula follows."

NOMINATING Committee Report is presented by Francis H. Wagner of Mead Corp. He is a past general chairman of the Pulp & Paper Section.

SOHIO'S injury index is discussed by O. C. Haier at the opening session. Haier is safety manager for Standard Oil Co. (Ohio), Cleveland.

Management must help

It is up to management to force the use of safety equipment when and where it is needed.

Douglas B. Chant, secretary-engineer for the Ontario Pulp & Paper Makers' Safety Association, went on to say: If a supervisor finds it necessary to use a particular piece of safety equipment on a certain job, top management must support him 100 per cent in making the use of such equipment company policy. However, Chant warned, the effort should still be made to correct the cause of injury: If the cause is corrected, use of the preventive equipment may in the future be eliminated.

Production vs. safety

Proof that 16.21 cords of pulpwood can be cut and stacked by one man in a nine-hour period was made clear in the motion picture, "Chain Saw Know-How". The film was presented at the Pulpwood Logging discussion session—one of many round table programs held during the Pulp & Paper Section meeting.

Only by disregarding all safety principles was the 16.21-cord cutting feat made possible. And this was the message of the picture.

Principal officers

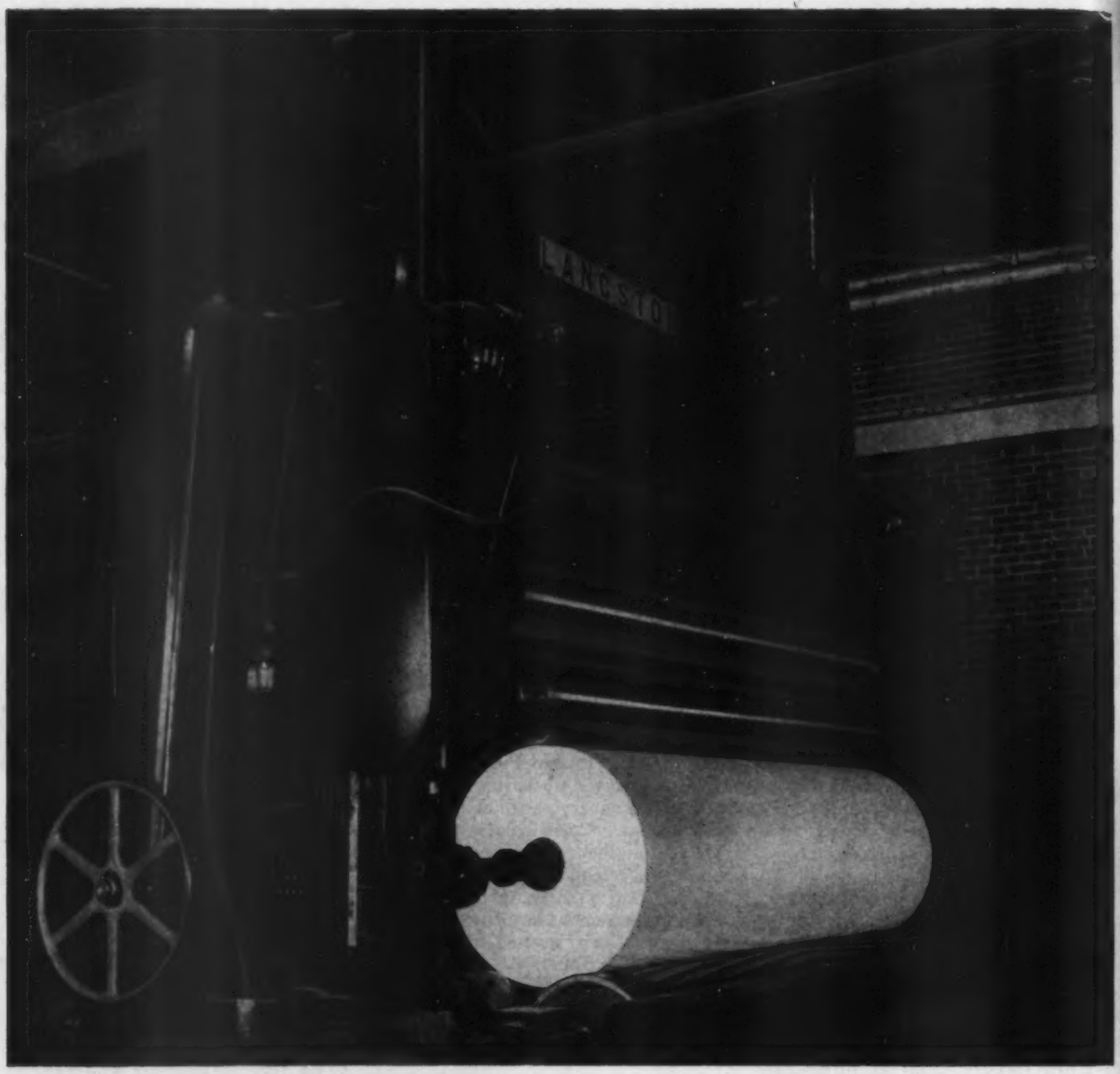
Among the principal officers of the Pulp & Paper Section for 1958-59 (in addition to those listed above) are:

Regional Representatives: Francis H. Wagner, director of safety for Mead Corp., Chillicothe, Ohio (*Chairman*); Arthur Carle, Northwest Paper Co. (*Lake States*); H. P. Heubner, Flintkote Co. (*Middle Atlantic*); Dallas E. Henry, Continental Can Co. Inc. (Southern Advance Bag Operation) (*Southern*); H. E. Newbury, Olin Mathieson Chemical Corp. (Ecusta Paper Div.) (*Central*); Earl F. Ripstra, Container Corp. of America (*Midwest*); Dan Adair, Pacific Coast Association of Pulp & Paper Manufacturers (*Pacific Coast*); Charles R. Hagan, Oxford Paper Co. (*New England*), and Douglas B. Chant, Ontario Pulp & Paper Makers' Safety Association (*Canada*).

Committee Chairmen: A. Scott

(Continued on Page 570)

SPEAKERS at an open meeting are greeted by R. G. Belknap, new section chairman. They are (l to r) Dr. E. J. Schowalter of Western Electric; Dr. J. M. Bosworth of Liberty Mutual Insurance, and George A. LaHusen of Crown Zellerbach.



Langston Slitter and Winder features precision roll density control

Here's a way for you to get uniform roll density from the core to the outside. This type "DH" Slitter and Winder features hydraulic rider roll control that automatically adds or subtracts rider roll weight.

This arrangement makes it possible to constantly maintain correct nip pressure to compensate for the changing diameter and weight of the rewound roll. A simple valve permits setting the correct rider roll weight for various grades and basis weights of both paper and board.

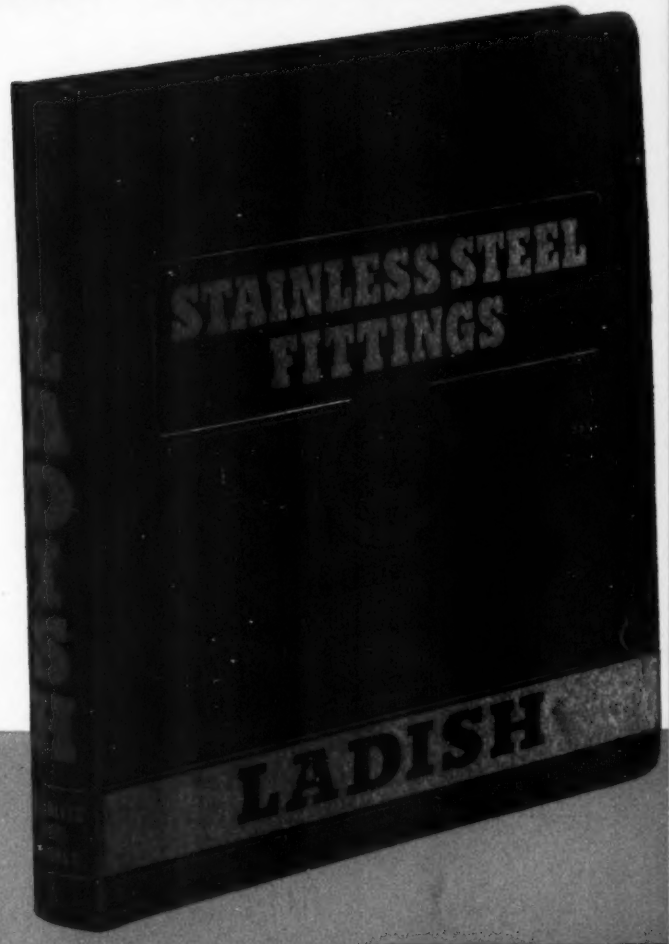
Pushbuttons for raising and lowering the rider roll during threadup replace complicated chains, sprockets, and bulky counterweights, thus speeding up production by reducing setup time.

Learn more. Write SAMUEL M. LANGSTON Co., 6th & Jefferson Sts., Camden 4, N.J.

LANGSTON leadership...by design

NEW LADISH CATALOG

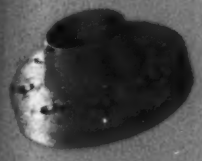
GIVES DETAILED SPECIFICATIONS, DIMENSIONS AND ORDERING INFORMATION ... PLUS USEFUL TECHNICAL DATA ON COMPLETE LINE OF STAINLESS STEEL PIPE FITTINGS

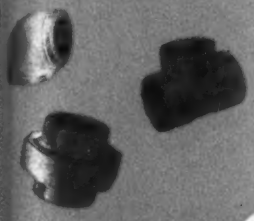


This 86-page Ladish catalog and technical data manual provides information vital to all who specify, purchase or install stainless steel pipe fittings.

Volume is tab indexed by type of fitting for quick reference to comprehensive tabulations of specifications, manufacturing standards and corrosion data.

Use the coupon below to get this one master reference manual on a complete line of stainless steel pipe fittings.





ONE MASTER REFERENCE FOR COMPLETE DATA ON ...

- **BUTT WELDING FITTINGS (IPS AND TUBE O.D. TYPES)**
- **FLANGES – ASA, MSS, LIGHT TYPE AND CORROSION WEIGHT**
- **SCREWED AND SOCKET FITTINGS AND UNIONS**

... complete line covers the broad range of types, sizes, wall thicknesses and material specifications to meet virtually any requirement.

TO MARK PROGRESS

LADISH CO.

CUDAHY (Milwaukee Suburb) WISCONSIN

Branch Plants: Milwaukee & Kenosha, Wis. • Los Angeles • Houston • Brantford, Ont., Can.

SALES OFFICES: Amarillo • Atlanta • Baton Rouge • Brantford, Ont. • Buffalo Calgary • Chicago • Cincinnati • Cleveland • Denver • Havana • Houston Los Angeles • Mexico City • Montreal • New York • Odessa • Philadelphia Pittsburgh • St. Louis • St. Paul • San Francisco • Seattle • Toronto • Tulsa

Mail **THIS COUPON FOR YOUR LADISH STAINLESS STEEL CATALOG** *Today!*

LADISH CO.
Cudahy, Wisconsin

Please send me without cost or obligation the Ladish 86-page Stainless Steel Fittings Catalog and Technical Manual.

NAME

TITLE

COMPANY

ADDRESS

CITY ZONE STATE

NEW! From Standard Oil

ESKAR

Waxes ★

Standard Oil offers the paper industry a full line of waxes to meet coating needs. Each of the four ESKAR Waxes has a high blocking point, excellent stability, high strength, and outstanding odor and oxidation stability. Here are suggested ESKAR Wax uses: **ESKAR R-50**—For special high blocking point, high gloss coatings. May be used straight or in blends. **ESKAR R-40**—For liners and overwraps where sealing strength is important. **ESKAR R-35**—For saturation waxing and carton applications. **ESKAR R-25**—For dry waxing, as a process ingredient and miscellaneous uses. Get more information about these new ESKAR Waxes. Call your sales representative in any of the 48 Standard Oil district offices in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from STANDARD and get it!

100 YEARS of CONTROLLED UNIFORMITY!

Here are just three of our present line of 300 proven styles . . . Each was developed to solve a particular problem in making heavy kraft . . . fine paper . . . board.

The mills which have proved these Hamilton Felts best for their needs know that it makes no difference how they re-order . . . by mail, telegram or phone they can confidently expect and get the same high quality, custom made pre shrunk for no sag, no stretch Hamilton Felt time — after time — after time.

All of these 300 proven styles can be shown to you by a Hamilton Felt Service Salesman. If one of these "standard 300" won't solve your specific need, we will be happy to design a Hamilton Felt that will. Write us, without obligation — today.

HAM FELTZ says:

"It's Wonderful to be 100 years old and as modern as Shuler & Benninghofen

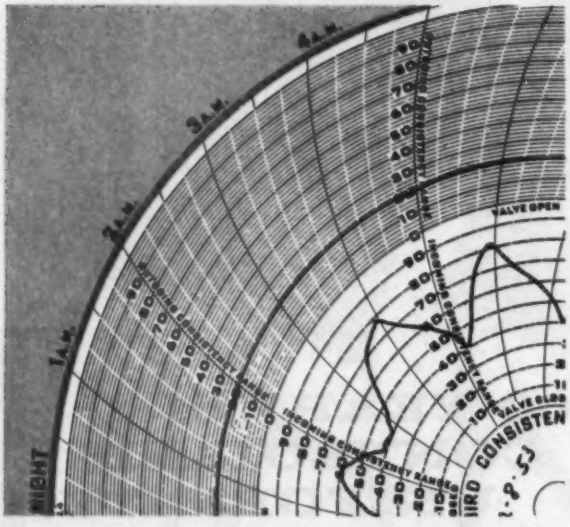
YOU CAN'T BEAT

Hamilton

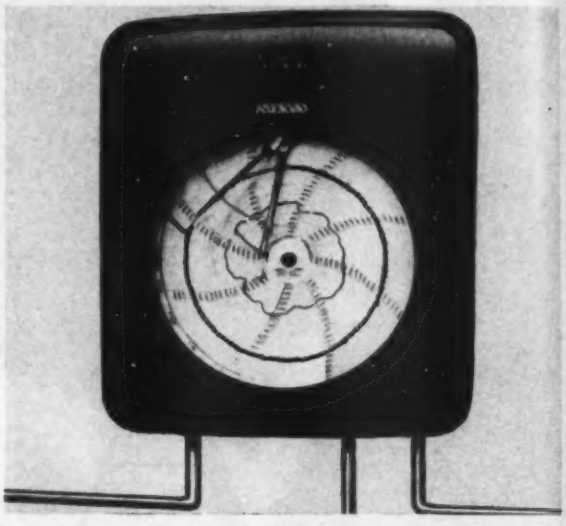
FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

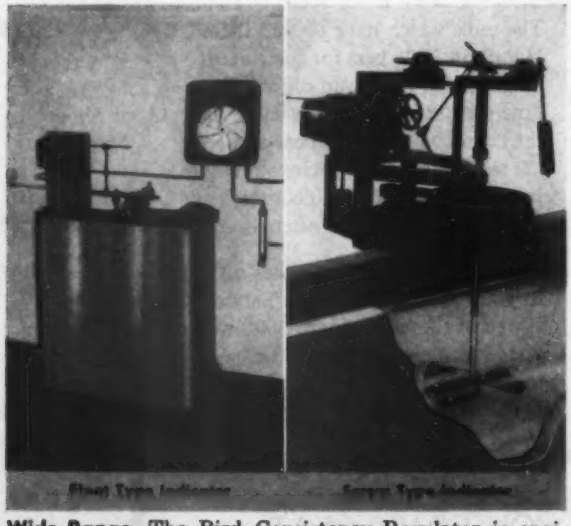
Good Reasons for Standardizing on The BIRD CONSISTENCY REGULATOR



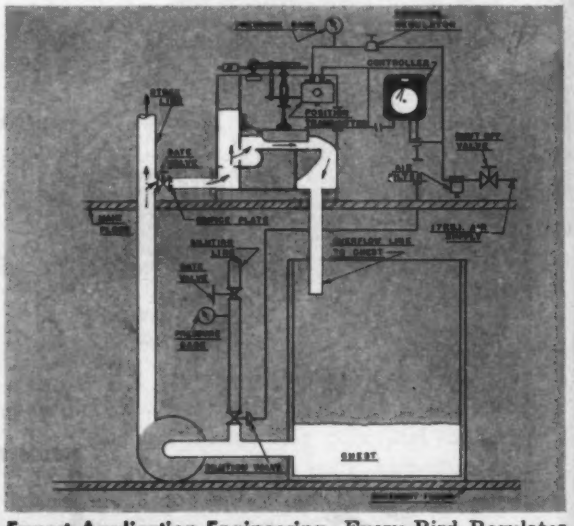
24-Hour Chart Record. The Bird Consistency Regulator provides a 24-hour chart record of both incoming and outgoing consistencies — a constant check on performance and positive proof that stock is neither overweight nor underweight.



Convenient Control. With the Bird Consistency Regulator, the recorder-controller may be located wherever it is most convenient for the operator. Adjustment in consistency may be made at the controller simply by turning a knob.



Wide Range. The Bird Consistency Regulator is engineered to handle consistencies from 0.5% to as high as 8% and to handle any flow of stock from less than 50 GPM up to 5000 GPM. Available with mechanical as well as pneumatic control.



Expert Application Engineering. Every Bird Regulator installation is individually engineered by experts to provide accurate, dependable consistency control, under the specific conditions of tonnage, consistency and dilution water pressure.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

CURRENT COMMENTS

Barometer: rising fast . . . high spots . . . paperboard optimism

by WARREN B. BULLOCK

The business barometer is rising and rising fast. All the indices show the paper and paperboard industry—particularly the latter—as heading for high gear by the early part of 1959. Financial editors and economists, both within and outside the paper industry, are in an optimistic mood. The mildest forecast of them all is that there is not likely to be any early stiffening of prices, and many men in the industry do not even agree with this view. Here are some of the high spots, not necessarily in the order of their importance, that justify forecasts of returned prosperity in the few short months ahead and indicate that a real boom may be underway in the not too distant future.

✔ Mead Corp. and KVP Co. were the first of the paper companies to give stockholders the benefit of better business with increased dividends. Mead raised its quarterly rate to 42½ cents per share from the earlier 40 cents, and KVP increased its rate 10 cents per share.

✔ The Federal Reserve Bank of Chicago in its official letter of early October described the present business upturn as "crisp and unequivocal."

✔ The paperboard field is setting the pace for the entire industry—with production nearing its high ratio and unfilled orders approaching larger tonnage than has been recorded for more than a year. Some prices for boxes advanced 5 per cent over July quotations, and further increases are expected before the end of the year.

✔ A scattering of income reports from paper companies shows higher profits than a year ago.

✔ Newsprint consumption showed an increase in August for the first time in 14 months.

✔ St. Regis, the first of the major companies to curtail its payments to stockholders, has beeen showing increased strength from a Wall Street standpoint, thus bringing optimistic comments from financial writers.

A convincing portrayal

The story of paperboard provides the most convincing portrayal of the progress of the industry, though the paper field is also showing some improvement. A rise in the prices of waste paper is symbolic of the increased need for raw material from which board is made. Production has been above the levels of a year ago for more than 10 consecutive weeks. Production still lags below the totals for a year ago, but demand indicates that the imbalance may soon be overcome. Output in the first three quarters of the year was 10,189,342 tons, only 2.8 per cent below the output in the first three quarters of 1957; but the spread for the first half of the year was 3.7 per cent. It seems certain that the year's total will compare favorably with the 1957 output, the second largest in the industry's history. John R. Kennedy, president of Federal Paper Board and also of the National Paperboard Association, thinks the fourth quarter of 1958 will be the best of the current year.

Comments from industry leaders, such as officials of International, Diamond Gardner and Olin Mathieson, are all optimistic. One leader thinks the demand for container board in the first half of 1959 will be 10 per cent above this year's figure. Several producers are beginning to think of higher prices but waiting for some one important company to take a step that might be followed throughout the industry. The fact that executives are speaking of possible higher prices is in itself a definite indication of better times to come, a situation already developing in the fiber box field, where a 5 per cent increase over July is in effect.

Financial Reports

Paper mill securities followed many Wall Street issues into high ground in early October. As of October 10 the market averages reached the highest figure ever known. Paper mill issues had risen sharply but as of that date had reacted from the earlier quotations.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Oct. 10, 1958	Sept. 10, 1958
American Can	51¼	47½
Same Pref.	38¾	37¼
Celotex	33⅜	34½
Same Pref.	* 18-18¼	* 18-18⅛
Certain-Teed	12⅞	11⅝
Champion P & F	41	41
Same Pref.	* 94½-95	94¾
Chesapeake	*33¾-34	31
Container	25⅝	24
Same Pref.	* 86-90	86
Continental Can	54½	49¼
Same Pref.	85	86
Crown Zellerbach	55¾	55¾
Same Pref.	94	* 94-95¼
Diamond Gardner	32⅞	33⅛
Same Pref.	31	* 30¼-31¼
Federal Paper Board	47½	44¾
Same Pref.	*21½-21¾	0¾
Fibre Paperboard	39	36¼
Same Pref.	128	121
Great Northern	54½	59
Hammermill	31	31¾
International	116½	107¾
Same Pref.	88	* 90-91
Kimberly-Clark	63⅜	62⅞
MacAndrews & Forbes	29½	29⅝
Masonite	36	37¼
Same Pref.	* 93-95	* 94½-95½
Mead	45⅜	42⅜
Same Pref.	*93-95	*94½-95½
Minnesota & Ontario	35¼	30½
Oxford	34¼	32½
Same Pref.	* 88½-990	93
Rayonier	20⅜	19¼
Riegel	35¼	30½
St. Regis	43⅛	39
Same Pref.	* 93⅛-94¼	* 94⅞-96
Scott Paper	69	68¾
Same $4 Pref.	* 93½-95½	—
Same $3.40 Pref.	* 78½-80½	* 79-83
Sealright	40¼	33¾
Standard Packaging	22⅛	—
Same $1.60 Pref.	68½	—
Same $1.20 Pref.	28½	—
Sutherland	40¾	41¾
Union Bag-Camp	39	37¼
United Board & Carton	31½	30½
United Wallpaper	7¼	7⅛-7¼
Same Pref.	* 15½-15¾	* 15-15½
U. S. Gypsum	88¼	87
Same Pref.	*158-159	*161¼-165
West Virginia	43⅝	40¼
Same Pref.	101	*100-102

New York Stock Exchange — Bonds

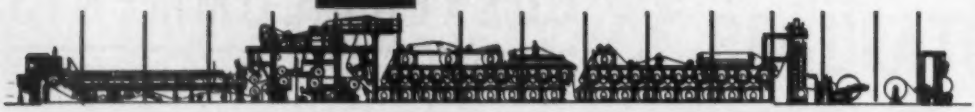
Champion P & F 3¼%	—	—
Champion P & F 3¾%	—	—
Kimberly-Clark 3¾%	95	94
Mead 3%	—	—
Scott Paper 3%	104⅛	100½

American Stock Exchange — Stocks

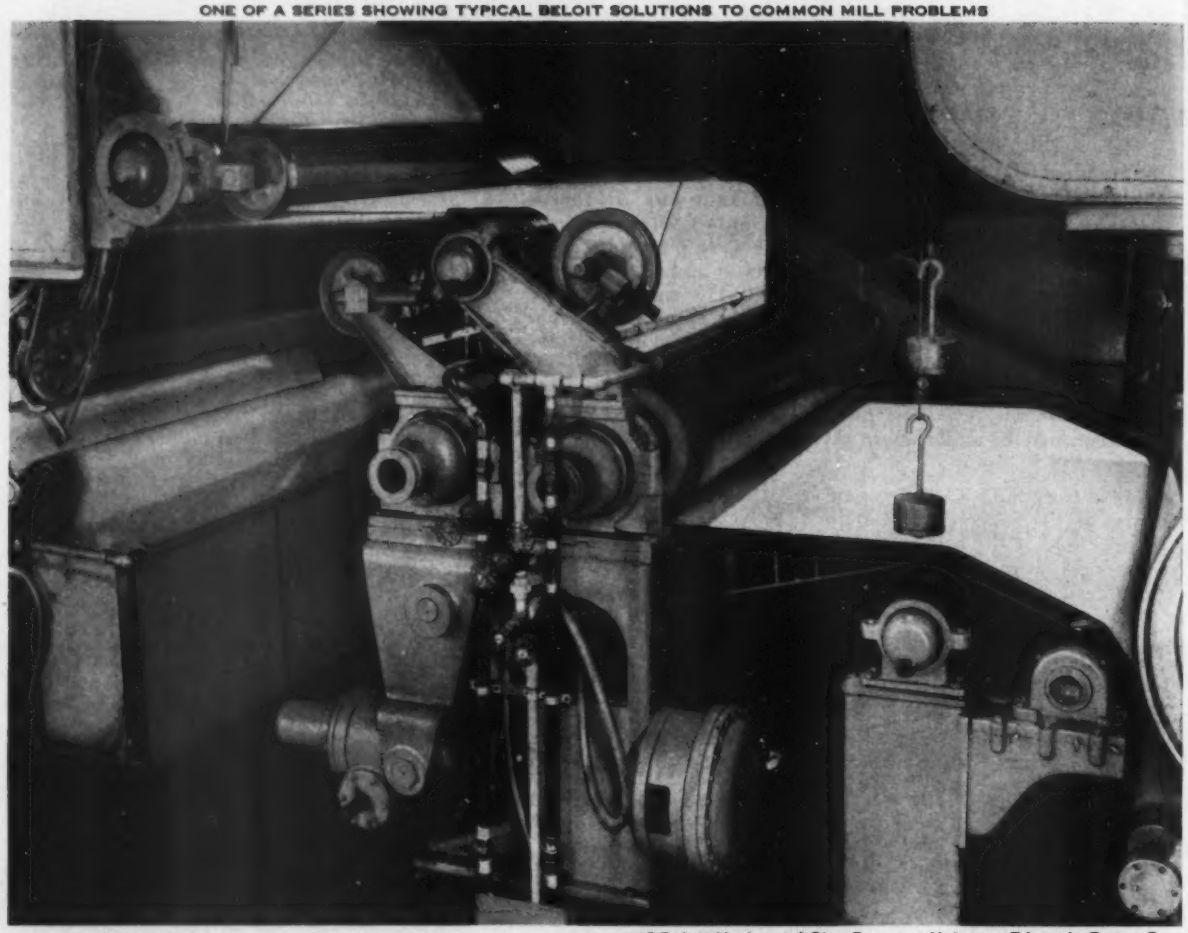
Allied Paper	9	10¼
American Writing	28½	25¼
Brown	12⅜	11⅝
Puget Sound	19	18⅞

*Closing Bid and Asked Prices

BELOIT UNIT MODERNIZATION



ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS



PATENTED

108" Beloit Horizontal Size Press at Nekoosa Edwards Paper Co.

Beloit Horizontal Size Press

an ideal low-cost addition where extended grade flexibility is desired

The Beloit Horizontal Size Press is unexcelled for uniform treatment of both sides of the sheet simultaneously. This versatile press can be used for light coatings as well as for more conventional size and starch applications. No full width pan is required. Excess solution is collected in simple edge pans at front and back sides. This compact arrangement, first conceived and built by Beloit 22 years ago, is an ideal low-cost addition to machines where extended grade flexibility is desired.

» **ACT!** *Write today for full information about Beloit Horizontal Size Presses. Address: Beloit Iron Works, Beloit, Wisconsin.*

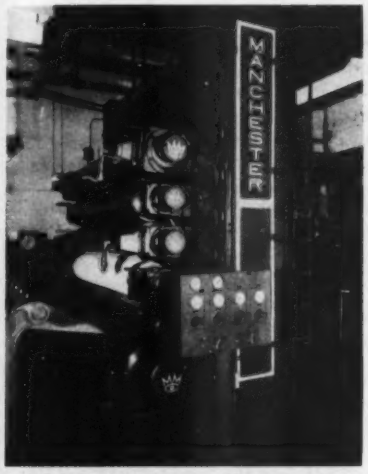
100 YEARS

BELOIT

PAPER MACHINERY

your partner in papermaking

NEWS of the INDUSTRY



OPEN-SIDE Manchester Machine calender recently installed by Howard Paper Mills.

Howard Paper Mills Completes Expansion

A modernization program started shortly after World War II has been completed at the Urbana, Ohio mill of Howard Paper Mills Inc.

The most recent project was the updating of No. 1 machine. This included the installation of a Manchester Machine Co. fourdrinier section, which has increased the wire width of the machine by 4 per cent and the wire length from 65 to 75 ft. This, according to the firm, has resulted in better trim control and has generally increased the plant's ability to produce high-quality bond, ledger and similar grades.

The Manchester fourdrinier section includes a breast roll, a shake mechanism and table rolls. All table rolls boast steel cores and are rubber-covered. Corrosion-resistant materials were used throughout the section.

Also supplied by Manchester Machine of Middletown was a six-roll calender stack. The unit is of entirely new open-side construction with anti-friction bearings throughout. It is so constructed that two additional rolls may be added when and if necessary.

The rolls are loaded hydraulically through an air-over-hydraulic system that affords simpler and more sensitive control. Operated from a separate machine aisle console, the stack is provided with equipment that allows the rolls to be counterbalanced individually.

Also included in the recent modernization and improvement: a new Manchester Machine reel and an Industrial Nucleonics Corp. Accuray basis weight control.

Swedish Success Means a Nova Scotia Mill

Approximately 1500 tons of pulpwood have been shipped from Nova Scotia to the big Skutskar, Sweden mill of Storra Kopparsberg Ltd.

In a completely new process tried for the first time this summer, the Swedish firm plans to process the wood into a premium grade sulfite pulp for the manufacture of fine paper and blends.

If the Nova Scotia wood produces a high-grade pulp, Storra Kopparsberg is expected to proceed soon with construction plans for a 350-ton pulp mill—its first in North America.

The provincial legislature has already approved the Swedish firm's application for a forest management license covering 1,200,000 acres.

FBA Sees Higher Demand for Shipping Containers

An upsurge in economic activity will probably push the demand for corrugated shipping containers to a new high during 1959. This view was expressed at the recent annual convention of the Fibre Box Association in New York, N. Y.

During the nation-wide gathering various executives reported price advances of 5 per cent over July quotations with prospects for another 5-per cent advance in the near future. Continued demand growth into 1959 is anticipated.

Higher costs are forcing price advances, according to several speakers, and one said that the box makers had "swallowed" all the cost increases they can afford.

Elected new president of the FBA was Charles H. Carpenter, vice president for container sales for the Kieckhefer-Eddy Div. of Weyerhaeuser Timber Co. at Pennsauken (Camden), N. J.

Gilbert to Install Valley Iron Machine

Gilbert Paper Co. of Menasha, Wis., plans to replace its No. 2 paper machine with a Valley Iron Works Co. unit that will have about 30 per cent greater capacity.

The new machine will be wider and faster and will incorporate a breaker stack, horizontal press and other recently-developed papermaking control features. Completion is scheduled for spring.

Production is to include ledger, index, bristol and other heavier-weight papers.

Oxford Improvement to Cost $15,000,000

During the next three years Oxford Paper Co. will invest $15,000,000 in major additions and improvements at its mill in Rumford, Maine.

The program will include: a new softwood kraft mill with a daily pulp capacity of 175 tons; a new chemical recovery plant for the burning of waste digester liquors (capacity: 300 tons per day); a new chlorine dioxide bleaching system for both long- and short-fiber pulps, and additions to the existing hardwood kraft mill that will increase daily production to 350 tons.

The completion of the project will end the production of sulfite pulp in Rumford and the resulting pollution of the Androscoggin River.

Buckeye Cellulose Sponsors Research at Swedish School

Investigation into the solution state of technical viscoses has been initiated by Buckeye Cellulose Corp. at the University of Uppsala in Sweden.

The three-year project involves the study of the molecular properties of

cellulose xanthate in viscose solutions and will relate molecular sizes and shapes to types of pulp and methods of xanthate preparation and dissolution.

According to both the university and the Memphis, Tenn. firm, no similar work has ever been undertaken.

O. H. Alderks, Buckeye vice president for research and development, has pointed out that the fundamental information that will be developed "is needed to guide pulp producers toward more precise tailoring of pulps to specific end-uses". At the same time, he said, manufacturers of rayon, cellophane, plastics and other cellulose-based products should be able to apply the findings to their processes in order to improve product performance.

The research is expected to reveal the nature and number of fundamental factors that influence the structure of the molecular aggregates in the solution. This information—coupled with present knowledge of supermolecular structure in the pulps used to prepare these solutions—would provide a basis for predicting the molecular architecture in the regenerated film or filament.

"Few Parallels": Container Corp. Makes Transportation History at Eastern Div.

The 100,000th freight car without payment of demurrage has been handled by the Eastern Div. of Container Corp. of America.

(*Demurrage is a penalty payment for delay to a freight car beyond the "free time" allowed for loading and unloading.*)

The record-setting no-demurrage car rolled out of a siding at the firm's big Philadelphia mill on the tracks of the Reading Railroad. The last demurrage payment was made by the firm in mid-1953.

A spokesman for the Reading had this to say regarding the event: "It reflects productive cooperation among general management, plant management and traffice management in which greater effectiveness and increased economy are realized by both the railroads and industry".

The combined record included Container Corp. plants at Boston; Baltimore; Greensboro, N. C.; Valley Forge, Pa.; Wilmington, Del., and two Philadelphia plants in addition to the paper mill.

The record established by Container Corp. has few parallels in railroad history, according to Arthur H. Gass, chairman of the Car Service Div. of the Association of American Railroads.

"Wonderful Cooperation"

Given the assignment of eliminating high demurrage payments among the eight plants were Harley McCane, Philadelphia plant manager, and Stanley H. Tippett, eastern traffic manager.

The answer, they said, "was overall teammork between traffic and every other department in the company". The record was made possible by four key factors:

1. Careful scheduling of shipments.
2. Complete performance records on all routings.
3. Routing all traffic via the best rail service.
4. The "wonderful cooperation" of all the plants.

"Solving the problem of needless car delays", according to McCane, "has further streamlined our operations through better housekeeping; improved scheduling of purchasing, production and distribution, and a free exchange of ideas."

One offshoot of the no-demurrage program, he continued, has been the inauguration of "inflatable" dunnage for blocking and bracing paperboard shipments in freight cars. This consists of air-filled rubber bags to protect the shipments. The result has been considerably reduced installation time for the dunnage, less cost and materials and the making of more space available inside boxcars.

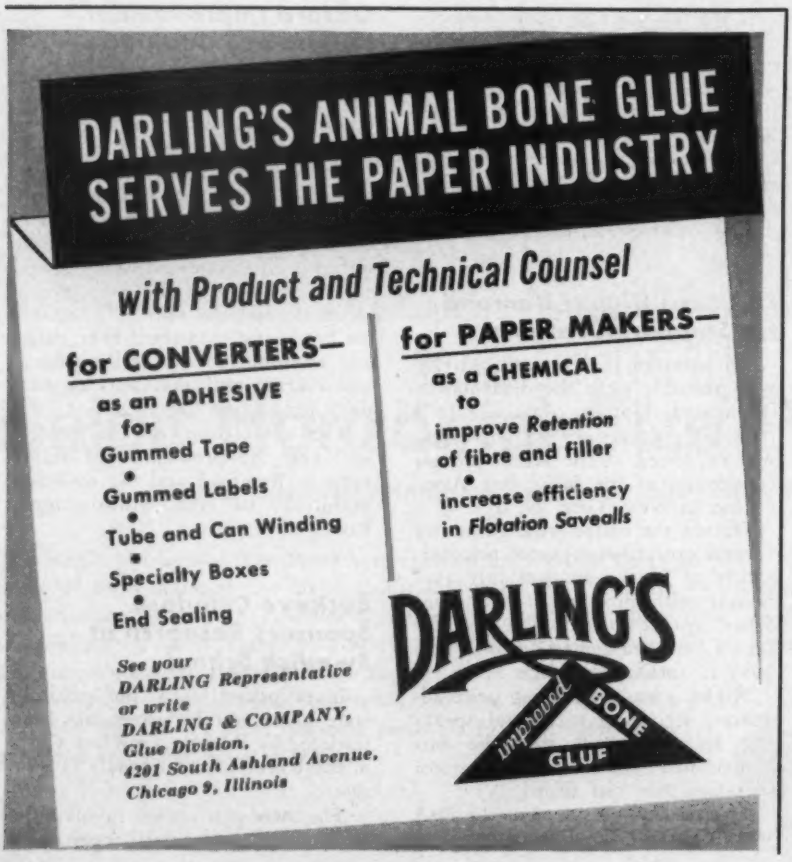
Canada Paper Aids in Fight on Pollution

Bark-burning equipment—the first of its kind in eastern Canada—has been installed at the Windsor Mills, Que. mill of Canada Paper Co.

Whereas it was previously necessary to empty bark into the St. Francis River, some 150,000 lb. are now burned every 24 hrs.

The anti-pollution program at the Windsor Mills plant has included the reduction of mill effluent, the neutralization of such effluent that cannot be avoided and the current bark-disposal project.

The bark is transported by conveyor belts through straining processes that greatly reduce its moisture content and then deposited in a giant oven



where temperature reaches 2200°F. The installation generates 600,000 lb. steam every 24 hrs, allowing its use in plant processes. In the event of lack of bark, supplementary oil-burning equipment has been installed.

Fiber Products Research Center Established

The organization in Beaver Falls, N.Y., of Fiber Products Research Center Inc. has been announced by James P. Lewis, president of J. P. Lewis Co.

First president of the research unit is Clark E. Thorp, formerly manager of the department of chemistry and chemical engineering at Armour Research Foundation in Chicago.

The simply-stated aim of the new center is: to develop new products, processes and materials.

Cooperating firms in addition to J. P. Lewis of Beaver Falls are: Latex Fiber Industries Inc., Beaver Falls; Brownville Board Co. Inc., Brownville; Payne-Jones Inc., Lowville; Smith-Lee Co. Inc., Oneida, and Milwaukee Lace Paper Co. of Milwaukee, Wis.

DG Opens California Molded Pulp Plant; Operations Integrated

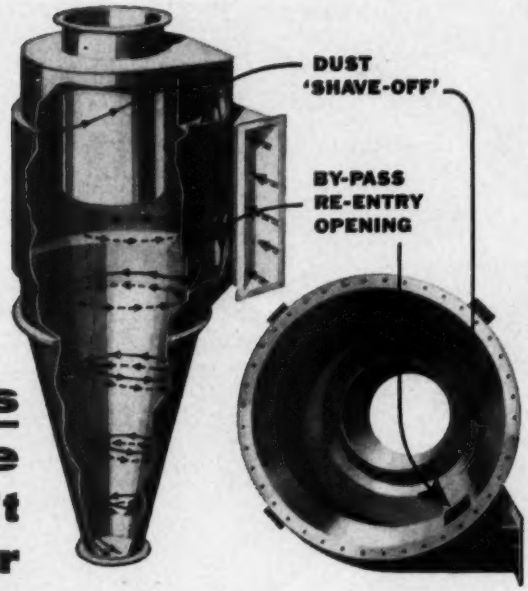
Diamond Gardner Corp. has dedicated its new $25,000,000 forest products center at a 400-acre site near Red Bluff, Cal.

The plant's annual capacity: 90,000,000 brd. ft. of finished lumber and about 30,000 tons of molded pulp products from mechanically-produced groundwood. (Included are trays for prepackaging meats and produce, egg cartons and disposable plates.)

Molded pulp products are now being manufactured by Diamond Gardner for the first time west of the Rocky Mountains.

At Red Bluff slabs and edgings from the automated sawmill operation are reduced to chips and conveyed through pipes to the molded pulp plant. Here the fibers are refined and chemically treated prior to being molded into the various products marketed on the West Coast.

According to a spokeesman for Diamond Gardner, "By using to the fullest possible extent the wood residuals formerly burned or discarded, the new plant furnishes our expanding economy with a variety of useful products while contribut-

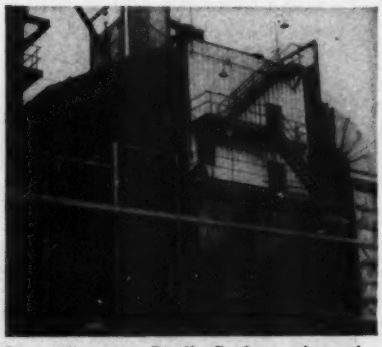


This Cyclone won't clog or plug

Buell's exclusive 'Shave-off' design permits large diameter cyclones that will not clog, plug, or bridge when properly operated: you avoid unnecessary maintenance work or process interruptions.

The unique Shave-off port traps the dust that whirls upward in double-eddy currents, increases cyclone efficiency by eliminating this source of dust reentrainment. Whether installed singly or in groups, Buell Cyclones are the most efficient ever developed.

Other features include extra heavy plate construction for longer service life, Buell-designed manifolds for more efficient, non-turbulent flow of dust-laden gases . . . and the confidence assured by a history of hundreds of installations everywhere in America. Write for a copy of the 12-page booklet, "The Exclusive Buell Cyclone": Dept. 56-K, Buell Engineering Company, Inc., 123 William St., New York 38.



Large-diameter Buell Cyclones in series with Buell 'SF' Electric Precipitator.

buell®

Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

DIAMOND GARDNER integrated forest products center near Red Bluff, Cal., where a 42-acre log pond assures a constant supply of raw material.

ing to the preservation of the forests . . . ."

(*A year ago Diamond Match Co. merged with Gardner Board & Carton Co. of Middletown, Ohio. Thus the new name: Diamond Gardner Corp. DG is one of the world's largest producers of molded pulp products. In addition to the new Red Bluff operations, Diamond Gardner molded pulp facilities are located at Ogdensburg and Plattsburgh, N.Y.; Palmer, Mass.; Brantford, Ont., and Great Yarmouth, England.*)

Recent Expansions in the Industry

Blandin Paper Co.
of Grand Rapids, Minn., has placed a contract with Appleton Machine Co. for a new supercalender and a rewinder. A part of Blandin's current expansion program, the machines are scheduled for delivery in April. The supercalender will boast a 148-in. face and a 12-roll stack and will operate at speeds of up to 1800 fpm. The rewinder, with a 150-in. face, will be capable of speeds of up to 3500 fpm.

Johns-Manville Corp.
has proposed a merger with L.O.F. Glass Fibers Co., the second largest firm in the glass fiber industry. The merger would be on the basis of one share of J-M common for each 2½ shares of L.O.F. common. (The latter firm was formed in 1955 through the merger of Glass Fibers Inc. and the Fiber Glass and Corrulux divs. of Libby-Owens-Ford Glass Co. L.O.F. production includes acoustical insulation products; corrosion-control materials; translucent structural glass-reinforced plastic panels; textile yarns for electrical insulation, fabrics, plastic- and paper-reinforcements.)

ENOUGH PAPER in two hours to produce a stack of November issues of The PAPER INDUSTRY as high as the Empire State Building will be turned out by this Appleton Machine Co. supercalender. The unit is to be installed at the St. Francisville, La. plant of St. Francisville Paper Co. Also on order for the southern paper manufacturer is a twin (370-ton) supercalender. The cost of both is to be more than $1,000,000. The supered paper capacity of each will be 2500 fpm. At the left: two of these bearing housings will support the 55-ton bottom roll, which in turn will support the nine-roll stack. At the right: on a flatcar ready for shipment are two of the four columns that will form the framework of the supercalender.

News of the Industry . . .

Standard Packaging Corp.
has announced that its Eastern Fine Paper & Pulp Div. will embark early in 1959 on a multimillion-dollar program of over-all capital improvement at its paper mills. The new program is designed not only to obtain a substantial increase in capacity, but also to maintain the highest standards of quality and service through major improvements in finishing, warehousing and shipping.

Charmin Paper Products Co.
is installing more than 50 pieces of new converting equipment at its Division A plant in Green Bay, Wis. The work is scheduled for completion this coming summer. Included among the aims of the project are the handling of wider parent rolls, uniform operating speeds for all equipment and flexibility in changing package sizes and in varying the type of wrapping material. In addition to machine replacement, lighting conditions will be improved and floors resurfaced.

Howard Smith Paper Mills Ltd.,
with headquarters in Montreal, has acquired virtually 100-per cent ownership of Huron Forest Products Ltd. with its 3500 sq. mi. of timberlands north of Blind River, Ont., modern sawmills, planing mills and timber storage yards. A pulp mill based on Huron Forest's timber re-

ON-TIME START-UPS *and satisfactory performance are the pledge of Pusey and Jones'* ***new management team***

Pusey and Jones' new management team has pledged itself and the entire P and J organization to meet your starting times, and to continue building the same high quality into its equipment, that has earned a reputation for satisfactory performance. Talk to your representative about how the new Pusey and Jones can contribute to your operations.

Paper Machinery Division

THE PUSEY AND JONES CORPORATION

WILMINGTON 99, DELAWARE

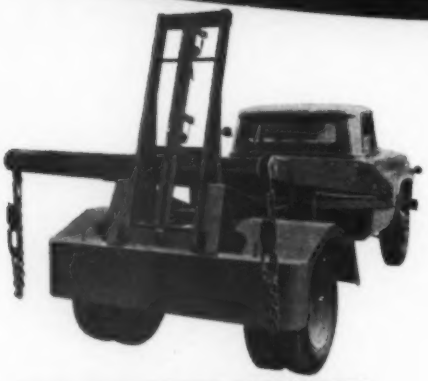
Shipbuilding • Heavy Metal Fabrications

EXPORT DIVISION: FRAZAR AND COMPANY, 50 CHURCH STREET, NEW YORK 7

REDUCE YOUR

WASTE DISPOSAL COSTS

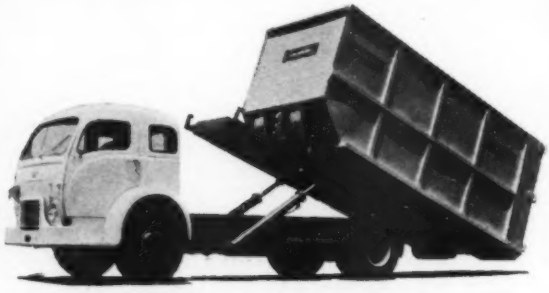
With These Low-Investment Systems



THE DEMPSTER-DUMPSTER

THE DEMPSTER-DUMPMASTER

THE DEMPSTER
COMPACTION TRAILER



THE DEMPSTER-DINOSAUR

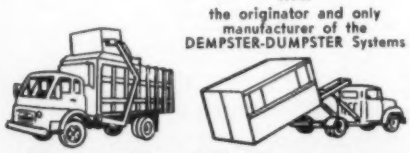
America's Most Complete Line of Waste Disposal Systems

The big savings in waste disposal are made with mechanized, containerized, collection equipment. Dempster Brothers, the pioneer manufacturer of containerization equipment, now offers four efficient systems to help you increase your efficiency and decrease costs.

The DEMPSTER-DUMPSTER handles containers up to 15 cu. yds. The DEMPSTER-DUMPMASTER, available in three sizes, picks up and empties containers from one through six cu. yd. capacity. Compaction bodies are 18, 24 and 30 cubic yards with capacities up to 120 cubic yards of loose refuse. The DEMPSTER Compaction Trailer will hold and haul over 200 cubic yards of loose material per trip and it can be loaded by the DEMPSTER-DUMPSTER GRD-304-F-2. The DEMPSTER-DINOSAUR offers giant containers up to 40 cu. yds. and over. Write today for complete information.

Mfd. By DEMPSTER BROTHERS INC.
the originator and only manufacturer of the DEMPSTER-DUMPSTER Systems

DEMPSTER DUMPSTER® SYSTEMS



Dept. PI-11 DEMPSTER BROTHERS - Knoxville 17, Tennessee

HANCHETT BAND SAW SHARPENER

Fully Automatic

MODEL 250 AUTOMATIC

FEATURES- Powerful straight line feed to saw teeth for precision accuracy. 100% Anti-friction bearings. Smooth, accurate, heavy-duty performance.
HEAD SLIDE HAS HARDENED WAYS (DUST SEALED)
ADJUSTABLE FEED FOR EITHER SWAGE CUP OR GULLET OF TEETH

CAPACITY- Band saws: 10" to 16" wide.
Tooth spacing: 1" to 3½".
Speed: 32 teeth per minute.

MOTORS- ¾ H.P. for Feed Works
1 H.P. for Grinding Wheel

IMPORTANT TO THE FILER

We MANUFACTURE the WORLD'S LARGEST and MOST COMPLETE LINE of FILING ROOM MACHINES and ACCESSORIES in ALL SIZES for; BAND-GANG and CIRCULAR SAWS (SEMI and FULL AUTOMATIC) - SWAGES - STRETCHERS - LAP GRINDERS - WELDING CLAMPS - STRAIGHT EDGES - GAUGES - SAW HAMMERS - ANVILS - WHEEL DRESSERS.
WRITE us for LITERATURE or CATALOGUES

COVEL SAW SHARPENERS HANCHETT ANVIL GRINDERS

DEALER INQUIRIES INVITED

HANCHETT MANUFACTURING CO. Main Office: BIG RAPIDS, MICH. West Coast: PORTLAND, ORE.

News of the Industry . . .

sources has been under study for some years.

KVP Co.
of Kalamazoo, Mich., has exercised its option to purchase 15 acres of land at Griffin, Ga., and will construct a converting plant and warehouse before the end of the year. Operation is scheduled for spring . . . . At the Devon, Pa. converting plant KVP will expand by approximately 30 per cent. Included will be additional manufacturing and warehousing facilities.

St. Regis Paper Co.
has announced that its subsidiary, Gummed Products Co. of Troy, Ohio, has been merged into the parent firm and is now being operated as a separate division. The Ohio firm is continuing under the direction of its former officers and will continue to produce and market its many gummed and laminated products. St. Regis acquired the outstanding stock of Gummed Products in 1956.

River Raisin Paper Co.
of Monroe, Mich., has purchased the former Lancaster, Pa. plant of Lehigh Inc. (Earlier this year Lehigh moved its plant to Easton.) River Raisin determined in a survey that Lancaster was best suited to serve its "rapidly expanding market in the eastern part of the United States".

Sutherland Paper Co.
of Kalamazoo, Mich., has acquired Superior Match Co. of Chicago and Monarch Match Co. of San Jose, Cal., in exchange for 60,000 shares of Sutherland common, cash and other considerations.

Mid-Continent Tab Card Co.
is a newly organized firm that is constructing a $150,000 plant at Denver, Colo. Scheduled for operation by the first of the year, the company will consume between 50 and 100 carloads of paper annually in the manufacture and printing of tabulating cards. Two new printing presses will turn out 1300 cards per minute.

Pillsbury Mills Inc.
is contemplating the expansion of its printing plant in Wellsburg, W. Va., as part of a $7,000,000 company-wide project. Included in the West Virginia program would be the installation of new equipment.

Abitibi Power & Paper Co. Ltd.
has established a Panelboard Div., according to a recent announcement by D. W. Ambridge, president. R. E. Costello, formerly manager of manufacturing (pulp and board), has been named general manager of the newly formed unit.

Continental Paper Products Ltd.
of Ottawa, Ont., is constructing a $2,500,000 converting plant at Pointe aux Trembles, Que., a suburb of Montreal. Supplying the new facility with kraft paper will be the mill of Canadian International Paper Co. in La Tuque. The Pointe aux Trembles plant will pro-

duce containers, bags, wrapping paper, etc.

Kimberly-Clark Corp.
will build a $1,100,000 warehouse and loading dock at Menasha, Wis. The seven-story building will measure 164 ft. by 208 ft. and will adjoin the present Lakeview mill warehouse.

Federal Paper Board Co. Inc.
has put into operation at Washington, Pa., "one of the most modern folding carton plants in the country". Situated on a 37-acre tract and with provision for possible future expansion, the facility consolidates the operations of the Steubenville, Ohio, and Pittsburgh plants. Federal Paper Board now operates seven carton plants and eight paperboard mills throughout the East and Midwest.

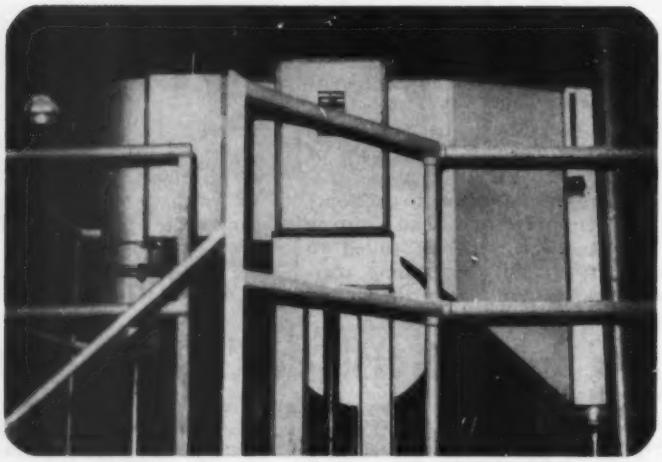
Potlatch Forests Inc.
has purchased the Paper Cup & Food Container Div. of Cupples-Hesse Corp., St. Louis paper converter. Potlatch Forests—of Lewiston, Idaho—will continue operation at the present location and has outlined a program for future expansion. (The purchasing company has extensive timberland holdings and operates lumber and paper mills as well as plants for the conversion of paper into milk cartons and paper cups.)

The Pulp & Paper Research Institute of Canada
at Pointe Claire, Que., has opened its new $2,300,000 laboratory, thus introducing "a new stimulus to research in pulp and paper". The facility was constructed by the Canadian government, which has announced that this capital outlay will replace its annual $100,000 grant of recent years.

American Box Board Co.
of Grand Rapids, Mich., has proposed the acquisition of Wolverine Carton Co. of the same city. On approval of the stockholders, the two

POIRIER

COUNTERFLOW
CONSISTENCY
AND BASIS WEIGHT
REGULATOR



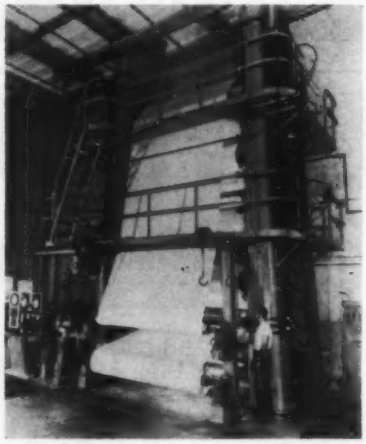
Guaranteed to—maintain basis weight at paper machine to within 2% plus or minus

Majority of installations holding basis weight within 1%

The counterflow is guaranteed to reduce by 50% any stock regulation problem from the blow-pit to the paper machine

For full information write for catalogue No. 1011

POIRIER CONTROL COMPANY
SPECIALISTS IN AUTOMATIC PULP STOCK AND VACUUM CONTROLLING EQUIPMENT
WATERVILLE, MAINE



NEWLY INSTALLED supercalender at the West DePere, Wis. mill of Nicolet Paper Co. is believed to be the largest such unit in the world now operating on glassine papers. Designed and built by Appleton Machine Co., the supercalender weighs 125 tons and may be operated either as a 15- or 16-roll unit. Width of the roll faces is 110 in. The top roll is 32 in. in diameter and weighs approximately 19 tons, while the bottom roll measures 38 in. and weighs about 24 tons.

Steam pressure on the intermediate steam rolls is regulated by Swartout control. A Denison hydraulic system controls the downward oil pressure applied at the top of the supercalender. The drive is by Westinghouse.

Threading speed is approximately 50 fpm, while the operating speed can be varied from 200 to 1000 fpm. Accommodating the production of the unit is a new Cameron Duplex rewinder trimming 104-in. rolls and operating at 1000 fpm.

firms will merge their interests in the folding paper box field. The Wolverine organization will remain intact, operating as a separate division and wholly owned subsidiary of American Box. It was incorporated in 1922 and is engaged in the designing and manufacturing of printed and plain folding paper boxes.

Dixie Cup Co. (Canada) Ltd. has completed a $400,000 addition to its Brampton, Ont. plant. The project increases the manufacturing area by 50 per cent and doubles the office space.

Allied Notes . . .

AB Kamyr of Karlstad, Sweden, has formed a special division within the organization that will be responsible for furthering and coordinating all technical developments sponsored by the firm and by its subsidiary and affiliated companies. Taking charge of the new division is Johan Richter, president of AB Kamyr, who has requested that he be relieved of all commercial and administrative duties so that he may devote his time to development work. Succeeding Richter as president of the Swedish firm is Kunt Dahl, president of Kamyr Inc. of Hudson Falls, N. Y. Taking over as head of the United States affiliate is Oliver A. Laakso, formerly of H. A. Simons Ltd. of Vancouver, B. C.

Albany Felt Co. together with a Swedish firm—Nordiska Maskinfilt Aktiebolaget of Halmstad—will operate a new $2,000,000 felt plant in Mexico. The facility will serve the growing needs of the paper industry in Latin America. A financial working agreement between the two companies will result in "improved services and technological advances".

A wide range of new developments in the coating of paper and board were recently demonstrated at the Fulton, N. Y. plant of **Black-Clawson Co.'s** Dilts Div. Participating in the lecture sessions and laboratory demonstrations were more than 50 members of the management, sales and design staffs of both Dilts and the Paper Machine Div. at Watertown.

Corn Products Co. is a new firm that has been created as the result of the recent merger of Corn Products Refining Co. and Best Foods Inc. The action adds the entire line of Best Foods bulk materials to the 450 industrial bulk products manufactured by Corn Products.

John W. Bolton & Sons Inc. (the Emerson Mfg. Co. Div.) of Lawrence, Mass., has been named sales agent for Tappi Standard laboratory equipment produced by Hermann Mfg. Co. of Lancaster, Ohio. In addition to the Tappi machines, Bolton-Emerson will handle the Hermann automatic press and the Kollergang beater.

[redacted] was formerly director of management development and at one time was personnel and safety supervisor for CZ mills in Port Townsend, Wash., and West Linn, Ore. From 1952 until 1957 he was resident manager at the San Leandro, Cal. converting plant.

D. S. Coney

J. D. Moran

[redacted] urban assistant

STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA

35 to 25,000 GPM/LP*

Where water must be constant and ample in paper and pulp operations, Layne Vertical Turbine Pumps perform with lifetime economy.

Whether the supply or the demand calls for a 4 inch well or any size up to 42 inches, Layne Pumps are designed and engineered to deliver the required GPM economically and unfailingly.

Pioneers and acknowledged leaders in the [redacted]mps de-[redacted]irements

[redacted]HIS
[redacted]TENN.
[redacted]ORLD

WATER WELLS · VERTICAL TURBINE PUMPS
WATER TREATMENT

To: Layne & Bowler, Inc.
Memphis 8, Tennessee

Gentlemen: Please send me bulletin No. 100.

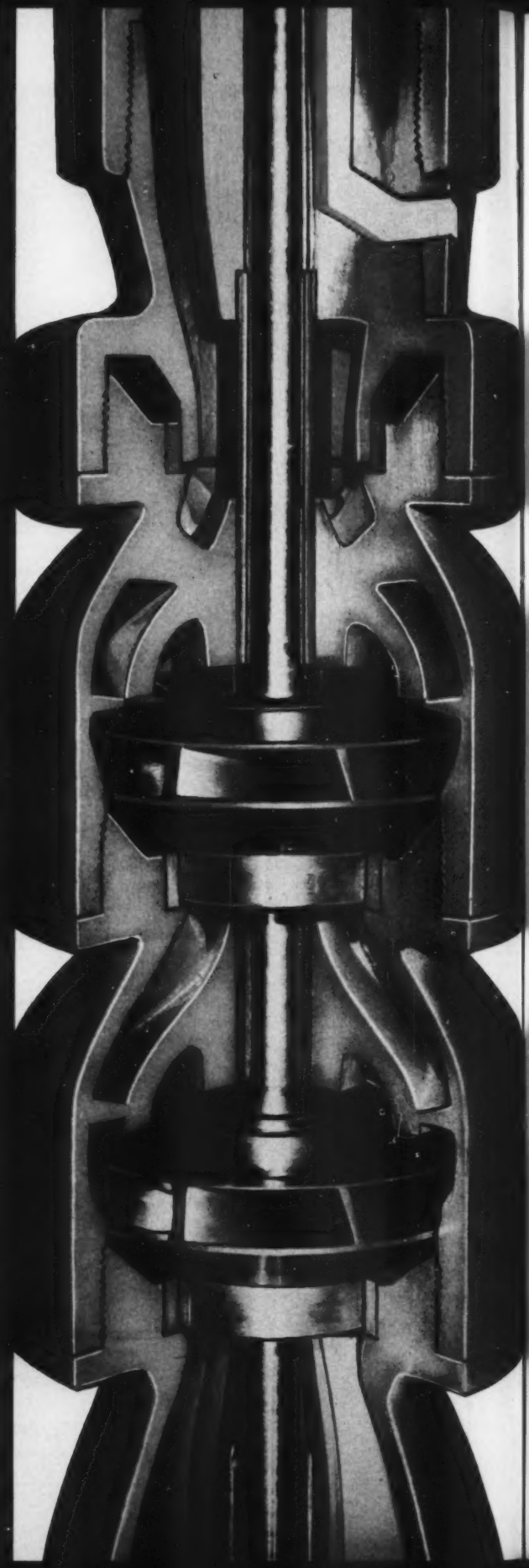
*Name*_____

*Title*_____

*Organization*_____

*Address*_____

*City*_____ *State*_____



NAMES *in the* NEWS

Frohman Retires as Head of West Virginia Division

Charles E. Frohman has retired as president of the Hinde & Dauch Div. of West Virginia Pulp & Paper Co. As an interim arrangement, David L. Luke will serve as chief executive officer of the division. Luke is president of West Virginia.

As president of Hinde & Dauch, Frohman carried out the negotiations that led to H&D's acquisition by West Virginia in 1953. Acquired through an exchange of common stock, Hinde & Dauch was operated as a subsidiary of West Virginia until 1957, when it was formally merged as a division.

Frohman had been an H&D executive for more than 20 years. He became president in 1951 following 10 years as vice president. He had formerly served as general counsel.

In another West Virginia change John M. Clabaugh has retired as paper mill superintendent at Luke, Md. He had been with the firm nearly 50 years and had been superintendent of the seven-machine plant since 1947.

Succeeding Clabaugh will be Roy P. Webber II and John L. Olewine. Webber, formerly assistant superintendent at Luke, will head the newly-designated upper mill (Machines No. 6 and 7 and the new units Nos. 8 and 9). Olewine will take charge of the lower mill (Machines No. 1 through 5). He was formerly assistant paper mill superintendent at Covington, Va.

L. Frank Thompson

R. L. Bentley

New Division Manager

Also announced was the appointment of L. Frank Thompson as manager of the Hinde & Dauch Div. He is a member of the board of directors and prior to his present appointment was manager of the Kraft Div. at Charleston, S. C. He is being succeeded at Charleston by Robert L. Bentley, since 1951 assistant manager of the Bleached Board Div. at Covington.

As manager of the H&D Div. Thompson will have full responsibility for all divisional operations. (H&D, with headquarters in Sandusky, Ohio, is one of the largest corrugated box manufacturing operations in the country.)

Bentley, who is Thompson's successor at Charleston, has been associated with West Virginia Pulp & Paper 11 years, having joined the organization as an internal auditor at the New York, N. Y. offices. He was named assistant manager of the Bleached Board Div. in 1951.

Allan B. Copping has been named assistant manager of the Otis Mill of International Paper Co. in Chisholm, Maine. Named to replace him as assistant manager of the Hudson River (N. Y.) mill was **Judson Hannigan Jr.** Hannigan was formerly assistant to the general superintendent at Hudson River.

Baker Middleton, since 1955 corporate staff personnel manager, has been made director of personnel for Scott Paper Co. He has held positions in the firm's plant and industrial relations departments and was at one time (1952) personnel manager of the Fort Edward, N. Y. mill.

Baker Middleton

F. A. Knight

Frank A. Knight has been named to the newly created position of production manager for Eastern Corp., Bangor, Maine. He will be responsible for the operations of the firm's paper mills at both Brewer and Lincoln, the sulfite pulp mill at Brewer and the new sulfate pulp mill at Lincoln. Knight joined Eastern's technical department in 1938, working as a chemical engineer on projects associated with improved quality and operating efficiency. Following service during World War II, he was made sulfite superintendent of the Brewer Div. and since 1948 has been manager of pulp manufacturing for the company.

D. S. Coney has been appointed assistant vice president in charge of industrial relations for Crown Zellerbach Corp. He was formerly director of management development and at one time was personnel and safety supervisor for CZ mills in Port Townsend, Wash., and West Linn, Ore. From 1952 until 1957 he was resident manager at the San Leandro, Cal. converting plant.

D. S. Coney

J. D. Moran

James D. Moran has been assistant vice president of Flintkote Co. He will serve as line assistant to Wilson Harvey, vice president and general manager of the Pioneer (West Coast) Div. and in addition will continue in charge of legal functions as well as supervise the division's public and industrial relations and advertising department. Moran, who joined the firm in 1950, was most recently director of public and industrial relations for the Pioneer Div.

Allied Personalities . . .

John C. Alderson is in charge of the new Cincinnati district sales of-

FLIPPING the LINT OFF "FLIP-TOPS"

Jenkins' METLKOR Web Cleaning Brush of DuPont Tynex Nylon

The gravure production plant of the Downingtown Paper Box Company, Downingtown, Pennsylvania is an engineering triumph. Here, Marlboro "flip-tops" are produced on Champlain presses at speeds up to 2400 cartons per minute.

HERE'S WHAT THE DOWNINGTOWN PAPER BOX COMPANY SAYS: Mr. George J. Wolfer, Gravure Supt. says: "Jenkins' METLKOR brushes are contributing to the overall economy and quality that is so important to our production. When we reorder brushes, they will be Jenkins' METLKORS."

HERE'S WHAT THE MANUFACTURERS OF THE CHAMPLAIN INLINE GRAVURE EQUIPMENT, OF BLOOMFIELD, N. J., SAY: "The Jenkins' METLKOR brushes used in the web cleaning process of our Champlain inline gravure equipment are superior in performance and efficiency and are providing satisfactory and economical operation for our customers all over the world."

JENKINS' BRUSHES FOR PRINTERS

Dampener Roll Cleaning • Cylinder, hold down • Web Cleaning • Dusting • Removal of anti-offset powder • Feed. PAPER MILL BRUSHES: Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Feed or Carrier • Static Elimination • Flocking • Felt Cleaning • Paint Brushes • Floor Sweeps • Void Detector

Specify Jenkins' METLKOR
the original . . . the best *Metal Core* brush

METLKOR®
CYLINDER BRUSHES
and **LIFEWOOD®** WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
— Serving Industry for 80 Years —
542 Pompton Ave., Cedar Grove
Essex County, N. J. • CEnter 9-5150

fice of Clinton Corn Processing Co. He was formerly assistant division sales manager at Atlanta, Ga.

Harry C. Todd has been named to the newly created post of manager of distributor sales for the Solvay Process Div. of Allied Chemical Corp. He is being succeeded as advertising manager by **William J. Cannon,** who joined the division's advertising department in 1954.

Valley Iron Works Co. of Appleton, Wis., has reported a reorganization and assignment of personnel at the executive level. **R. A. Peterson** continues as president and general manager. Other assignments include: **W. A. Homes,** assistant general manager; **Talbot Peterson,** secretary; **Willard C. Notbohm,** assistant executive vice president; **Gregory A. Schulte,** treasurer; **Paul Boronow,** vice president of pulp and paper equipment sales; **W. K. Kolb,** vice president in charge of industrial sales; **George E. Reynolds,** chief engineer; **Carl G. Malmberg,** works manager, and **Helm C. Hussner,** general superintendent. Named district sales managers were: **Richard U. Temple, Raymond A. Bennett, Harold A. Norseen** and **William S. Mounts.**

John Leidy, formerly associated with Fraser Paper Ltd., has been named a sales representative for H. Waterbury & Sons Co. His territory includes Pennsylvania, New Jersey and Delaware.

Eugene L. Vogt, for the past four years a member of the field service engineering staff, has been made felt sales manager for Huyck Felt Co. His territory includes Illinois, Kansas, Missouri, Oklahoma and parts of Indiana, Iowa and Wisconsin. . . . At the same time **Edwin G. Sielewicz** was named field service engineer for Michigan and parts of Illinois, Indiana, Ohio and Pennsylvania.

Leon E. Smith is retiring from active extensive travelling for Rice Barton Corp. but is being retained for special duty on sales engineering and consulting. He is making his headquarters at Chester Valley Engineers in Paoli, Pa.

Albany Felt Co. has recently appointed two new service engineers: **Merton H. Rubeck,** formerly a senior designer and specialist in multi-cylinder board and roofing machines, and **George G. Marsanskis,** formerly superintendent of Eastern Corp.'s paper mill at South Brewer, Maine.

Necrology . . .

Aytch P. Woodson

Aytch P. Woodson, a nationally-known leader in the wood products industry, died in October at a Wausau, Wis. hospital. He was 77.

Woodson was one of a small group of men who established Masonite Corp. in 1926 and retained the posts of secretary and director at the time of his death.

Prominent in the paper manufacturing and converting fields, Woodson was board chairman of Mosinee Paper Mills Co.; president and a director of Bay West Paper Co.; a director of American Box Board Co.; Longview Fibre Co., and Marathon Paper Mills of Canada Ltd. In addition, he held directorships and various executive positions in numerous other firms.

Dr. Leslie G. Joyner

Dr. Leslie G. Joyner, 46, former manager of fundamental research for Sutherland Paper Co., died in September at Kalamazoo, Mich.

For reasons of health Dr. Joyner had recently requested a less-demanding position and at the time of his death was serving as a Sutherland research engineer.

A graduate of Brown University with a doctorate from Cornell University, he came to Sutherland in 1957. Dr. Joyner had formerly been director of research for Godchaux Sugars Inc. in Reserve, La., and at one time had studied at the Mellon Institute in Pittsburgh on a Gulf Oil Co. scholarship.

Thomas W. Ross

Thomas W. Ross, a former Milwaukee executive and a pioneer in the paper box industry, died recently at Morristown, N. J. He was 95.

From 1918 to 1921 Ross was a vice president of the old Hummel & Downing Co. in Milwaukee, now Cornell Paperboard Products Co. (His son, Randall A., is now senior vice president.)

A native of Portsmouth, Ohio, Ross began his paperboard career in 1904 at Ohio Boxboard Co. in Rittman.

After leaving Hummel & Downing in 1921, Ross was a co-founder

of Hummell-Ross Fibre Corp. in Hopewell, Va., now a part of Continental Can. Co. Inc. He served as vice president until his retirement in 1948.

John C. Dieffenderfer

John C. Dieffenderfer, retired sales executive with the Paper Makers Chemical Dept. of Hercules Powder Co., died late in September at his Fort Lauderdale, Fla. home.

Widely known in the paper industry, Dieffenderfer had been associated with paper manufacture for 36 years prior to his retirement. He joined the Paper Makers Chemical group in 1920 at the Easton, Pa. office and in 1924 was transferred to Stoneham, Mass., in a sales capacity. Dieffenderfer returned to Easton in 1926 as plant manager in charge of sales and in 1938 moved to the Wilmington, Del. home office as district sales manager.

Henry C. Segerstrom, 55, chairman of International Paper Co.'s packaging committee, died suddenly recently at New York, N. Y. He joined the firm in 1951 as sales promotion manager of the Container Div. and became committee chairman in 1958.

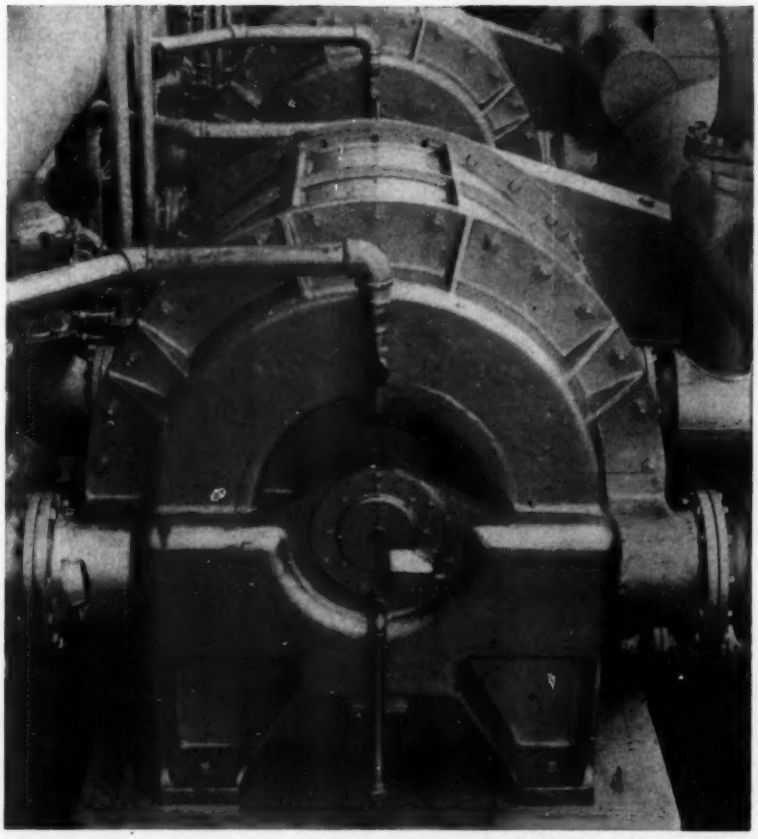
Alfred H. Montville, 41, for the past three years a southern representative for the Shartle Div. of Black-Clawson Co., died recently at his Atlanta, Ga. home.

George J. Smart, 49, printing papers sales manager for Hammermill Paper Co., died recently at Erie, Pa. He joined the firm in 1934 in the order department. Several promotions brought him to the post of eastern district sales manager in 1948 and to that of printing papers sales manager in 1957.

W. F. Anderson, a director and operations vice president for National Gypsum Co. in Buffalo, N. Y., died in September at the age of 56. He joined the firm in 1951 as production manager and was made vice president for manufacturing in 1954. Anderson was appointed senior vice president in 1956.

Hyman J. Lavner, 62, vice president and purchasing agent for Electric City Paper Mills Inc. in North Tonawanda, N. Y., died September 30. He had been an official of the company since its founding in 1947 and was previously executive director for Westinghouse Electric Corp. in Syracuse.

High machine speeds?
High temperature headbox stock?
You need NASH Vacuum Pumps!



Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

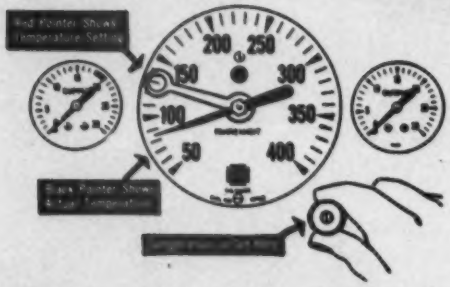
When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

441 WILSON ROAD, SO. NORWALK, CONN.

New wet end dryer control improves finish . . . helps stop picking, curling, cockling on all types of paper



Picking, curling and cockling of paper or board usually means one thing—poor temperature control on the first few wet end dryers.

The best way to end this problem is with the new Stickle automatic temperature control for individual wet end dryers.

This system makes it easy to set any temperature desired in each dryer. And once set, temperatures are maintained automatically, within 1% plus or minus.

The system shows at a glance the temperature set, actual temperature inside the dryer, flow and temperature of condensate leaving each dryer.

It is the fastest acting, the simplest and most accurate system ever developed for this purpose. Yet it costs less to install, less to operate and less to maintain than any other system. And, when installed as directed, the system is guaranteed to meet predetermined standards.

Write, wire or phone for details.

FREE!

Bulletin 560-A

Shows at a glance the step-by-step operation of the new Stickle system for automatic temperature control of wet end dryers.

STICKLE STEAM SPECIALTIES COMPANY

2215 Valley Ave. • Indianapolis 18, Ind.

Moisture Control Systems
Dryer Drainage Systems
Feed Water Heaters
Vacuum Pumps
Micro Adjustable Orifices
Differential Control Valves

PATENT REVIEWS

MELVIN NORD

Movable table and suction box structure for fourdrinier machine

U.S. 2,833,184, issued May 6, 1958, to Joseph Baxter Jr. and assigned to Black-Clawson Co., provides a fourdrinier paper machine incorporating a control arrangement for the water draining from the newly-formed paper web. The water is directed outwardly to one or both sides of the machine from between the top and bottom runs of the wire without the necessity of saveall trays, thus eliminating a large proportion of the weight of the machine.

The major portion of the wire section that supports the table rolls consists of a number of transverse trusses supporting a covering roof of sheet metal. This is inclined downwardly toward one or both sides of the machine to receive water draining from the table rolls and to direct it laterally out of the machine for discharge to the pit without passing through the return flight of the wire below the machine.

Controlling the concentration of liquors from evaporators

U.S. 2,833,619, issued May 6, 1958, to Vincent P. Owens and assigned to Combustion Engineering Inc., provides a means for controlling the concentration of liquor and the temperature of the hot gases as they leave the evaporator in the recovery of heat and chemicals from black liquor.

Production of laminated plastic-impregnated paper tubes

U.S. 2,833,684, issued May 6, 1958, to Joseph Horowitz and assigned to Babbitt Pipe Co. Inc., provides a process for making laminated non-porous plastic tubes.

One hundred pounds of a solution, 60 per cent phenol-formaldehyde resin and 40 per cent alcohol, are mixed with between 7 and 60 lb. of a thermosetting copolymer consisting of about 60 per cent vinyl chloride and 40 per cent acrylonitrile at about 8°F. This mixture is sprayed onto paper. The phenolic resin penetrates the paper fibers, while the copolymer remains primarily on the surface. The sprayed paper is then baked for 30 min. at 250°F to evaporate moisture in the paper, to eliminate alcohol and to cause the resin to enter the "B" stage. The paper is then formed into a tube containing a number of laminations. The resin is then cured at 1000 psi by heating at 340°F for about 4 min. The resin and the copolymer thus become chemically linked. The tube is finally baked at 300°F for about 3 hrs.

Method of improving flow of stock from the stock inlet of a paper machine

U.S. 2,832,268, issued April 29, 1958, to Gardner C. Boone, George Burkhard and Peter E. Wrist, assigned to Ontario Paper Co. Ltd., relates to a method of controlling the condition of the stock as it is introduced upon the forming table of a fourdrinier paper machine.

In papermaking the functions of a stock inlet are to receive the stock and project the stock onto the moving wire cloth in a suitable state of agitation, with uniform volume per unit time and with uniform consistency, direction of flow and velocity. In conventional practice stock inlets include various devices designed to promote one or more of the above functions.

A particular device may, however, be favorable to one function and unfavorable to another so that in the aggregate the construction of stock inlets in commercial use includes provisions that effect a compromise between the various ideal requirements. Thus, for example, the flow of stock to the paper machine may be spread from a single pipe across the full width of the machine by first dividing the flow into two streams, which are then fed into the stock inlet from opposite sides. This arrangement provides fairly uniform distribution of the stock across the machine but introduces undesirable cross-flow eddies. In an effort to compensate for this

undesirable feature, perforated rolls or similar devices may be interposed in the stock inlet at a point between the stock entry point and the slice. These are, however, only partially effective and, if placed too close to the slice, cause the flow of stock from the slice to divide into a number of separate streams. A further method is to employ a series of flat vertical plates or flow eveners close to the slice in order to reduce cross eddies in the stock flow. The introduction of such flow eveners tends to divide the flow into a series of separate streams across the width of the machine. A device that is thus introduced to reduce cross eddies in the flow, therefore, itself promotes an undesirable systematic variation in the condition of the stock as this is discharged across the width of the paper machine. In existing machines, these various devices have been used or combined in a measure of compromise to provide a relationship tending in the aggregate toward a preferred type of flow at the point of discharge. As the speed of a machine is increased, such compromises become less satisfactory, and in many cases in practice the maximum operating speed of a machine is restricted by the inability of the stock inlet to provide a suitable flow of stock onto the wire.

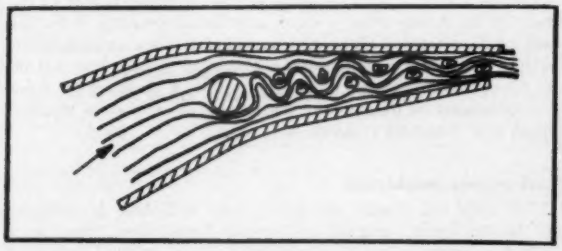


Fig. 1

As shown in Fig. 1, the method used in the present invention consists of disposing in the stock inlet a transverse cylindrical body having at least two lines of flow separation such that the flow of stock past the cylindrical body is characterized by a Reynolds number in excess of 10^4. A series of aperiodic vortices is shed from each of the lines of flow. Prior to projection of stock onto the wire, the flow is maintained in a confined channel until the diffusion of vortices is substantially complete.

Bleaching groundwood pulp

U.S. 2,826,478, issued March 11, 1958, to Frederick L. Schucker and assigned to Rohm & Haas Co., describes a process for bleaching groundwood pulp involving the use of a water-soluble hydrosulfite in conjunction with an alkali metal citrate.

According to the inventor, it has been found that enhanced brightness is obtained in the hydrosulfite bleaching of groundwood pulp when the bleaching is effected at a pH of 4.5-6.0 and the bleaching solution contains a small amount of an alkali metal citrate with or without a small amount of an alkali metal tetraborate. The action involved when the citrate is employed is not explained. It is apparently not merely a buffering or a sequestering action since tartrates, acetates and lactates provide little or no improvement. It has also been found that the addition of citric acid alone to sodium hydrosulfite bleaching solutions has little or no effect on the brightness obtained unless the pH is practically simultaneously adjusted to a pH of 4.5-6.0.

Manufacture of composite molded board

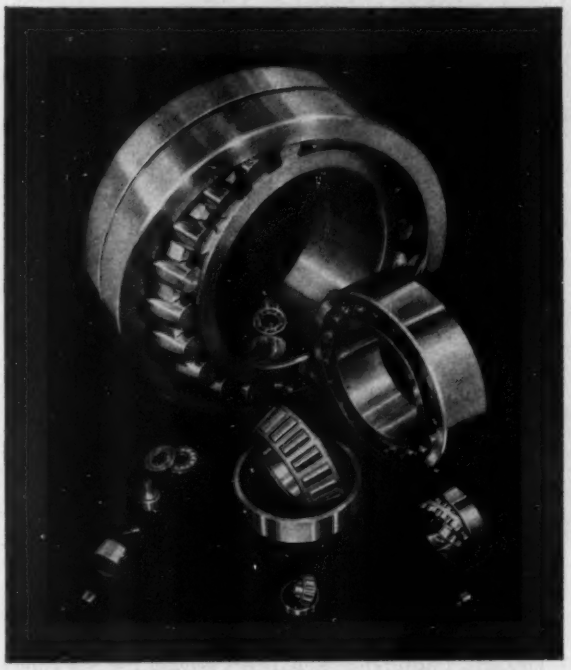
U.S. 2,835,622, issued May 20, 1958, to James d'A. Clark and assigned to Changewood Corp., describes a method of manufacture of structural board prepared from woody particles molded under heat and pressure and provided with modified surface layers for flame-proofing or for decorative purposes.

The object is to avoid warping, which is inherent in such unbalanced structures.

In accordance with the practice of this invention, the factors that cause warpage of a board with an unbalanced construction and thus the production of an undesirable board, are substantially overcome by specific molding techniques. One condition employed is to maintain a low consolidating pressure so that the density of the board will be as low as can be tolerated consistent with the lower strength and greater water absorbency characteristics. Another condition that leads to improvement in the product resides

BELOIT UNIT MODERNIZATION

ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS



Need replacement bearings?

Whether you need a paper machine bearing for stock or emergency replacement call on Beloit.

Beloit's bearing inventory offers a wide range of bearings commonly used in the paper industry. As a matter of fact, Beloit Iron Works maintains the largest stock of paper machine bearings in the world. Call on Beloit first. You will be pleased with the price and the prompt delivery.

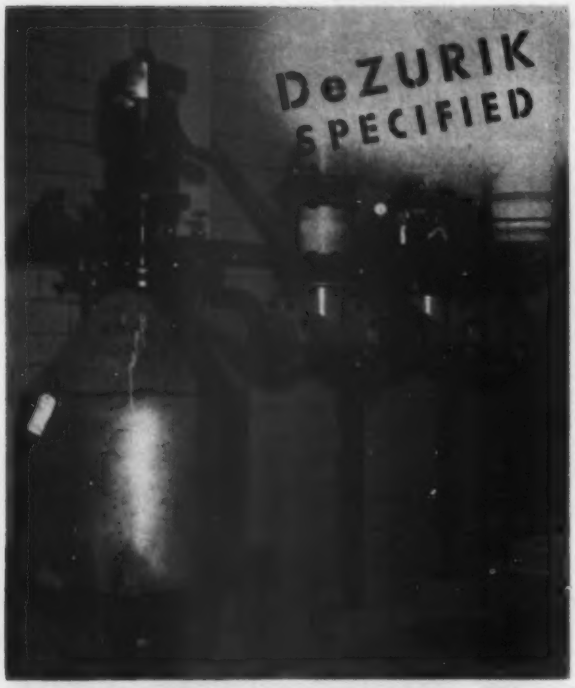
» **ACT!** *Write for bearing catalog. Complete inventory enables us to meet emergency needs promptly. Send inquiries to Beloit Iron Works, Beloit, Wisconsin.*

100 YEARS

BELOIT

PAPER MACHINERY

your partner in papermaking



in mill after mill!

DeZurik Consistency Regulators *remain* the top choice of mills everywhere! Over 3000 installations have proved beyond doubt that DeZurik Regulators offer more to begin with and continue to deliver top performance year after year after year!

ACCURATE

DeZurik Regulators are *guaranteed* to hold stock consistency within limits of plus or minus .1%. Many of them, installed directly ahead of paper machines, are holding consistencies to plus or minus .02%!

DEPENDABLE

Spattering stock cannot affect the performance of DeZurik Regulators. They do not need constant attention, they set easily, hold precisely and provide a 24-hour chart-record of incoming and outgoing consistencies.

DeZurik Consistency Regulators are available in three basic types to adapt to a wide variety of installations such as regulating stock after high density pulp storage chests, basis weight control, stock metering systems and refining systems.

Write for more details on DeZurik Regulators.

DeZURIK CORPORATION
SARTELL, MINNESOTA

Patent Reviews . . .

in keeping the molded boards flat and hot after molding to allow some release of internal stresses by plastic flow.

Although some improvement results from such modifications, complete elimination of warpage in boards of unbalanced construction, so as consistently to produce relatively flat uniform products, has not been achieved.

To produce molded boards of unbalanced construction consistently having relatively flat surfaces it has been found expedient, in accordance with this invention, to employ one or more specific techniques to compensate for the natural tendency of the board to warp by selectively increasing or decreasing the normal shrinkage in predetermined strata of the board. If the board warps after fabrication to make side A convex, the steps to be taken include the use of a platen at higher temperature adjacent the surface A, which means increase the shrinkage of the adjacent side.

Another means is to incorporate higher moisture content in the strata on the A side than in the B side before pressing. A further means is to employ a higher concentration of resinous material or the like on the outer strata on the A side as compared to that on the B side. Other possible means may reside in changing the types of resin binders on the opposite sides and in extreme cases, employing platens of suitable contour.

Packaging material

U.S. 2,828,240, issued March 25, 1958, to Robert de S. Couch and Milton Yezek, assigned to General Foods Corp., describes a method of producing packaging material useful in retail packaging or cartoning of goods that must be protected against loss of moisture to or absorption of moisture from outside the package.

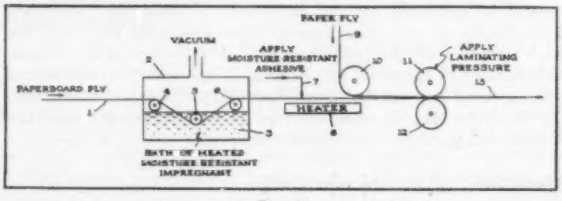


Fig. 2

The process is shown in Fig. 2. In the drawing the board that is to be impregnated and form the inner ply is drawn from strip 1 and passes through an evacuated chamber 2 containing a bath 3 of hot liquid impregnant. The strip is caused to move through the bath by guide rollers 4, 5 and 6, dipping under the surface of the bath and then emerging from the bath before leaving the evacuated chamber.

Beyond the vacuum chamber moisture-resistant adhesive is applied to the strip and distributed over its surface as indicated by the arrow 7. Then while the moving strip (with its impregnant and adhesive) is kept hot by heating means 8, the paper that is to form the outer ply is drawn from strip 9, which passes around a roller 10 into a path parallel to that of the strip 1. The two strips 1 and 9 are then suitably pressed together by passing them between rollers 11 and 12. The laminated strip or web leaves the rolls at 13.

Recovery of heat and chemicals from black liquor

U. S. 2,840,454, issued June 24, 1958, to George H. Tomlinson and George H. Tomlinson II and assigned to Howard Smith Paper Mills Ltd., relates to the recovery of chemicals and heat from the flue gases discharged from a chemical recovery unit in which pulp residual liquor is incinerated.

The main object of the invention is the provision of an improved cyclic recovery system having a high thermal efficiency and low chemical losses. It is particularly characterized by an increased degree of liquor concentration in direct contact liquor evaporating apparatus without the release of noxious gaseous sulfur constituents or the inclusion of sulfur oxides or residual liquor in the discharging flue gases, the recovery of substantially all of the sodium sulfate fume in the flue gases and the produc-

tion of large quantities of warm water uncontaminated by corrosive chemical constituents of the residual liquor.

Preparation of mineral-filled papers

U. S. 2,839,397, issued June 10, 1958, to Irving J. Gruntfest and David B. Fordyce and assigned to Rohm & Hass Co., describes a process for producing mineral-filled papers by introducing to a suspension of the pulp a mineral-filler in a finely-divided condition.

In accordance with the present invention, the deposition of formed fibrous structures such as paper from aqueous suspensions containing the fiber and the mineral-filler is greatly improved by the incorporation in the suspension, during the deposition or prior to the deposition, of extremely small amounts of certain retention agents. The improved retention appears to be the result of a bridging action between the fiber and the filler effected by the retention agent.

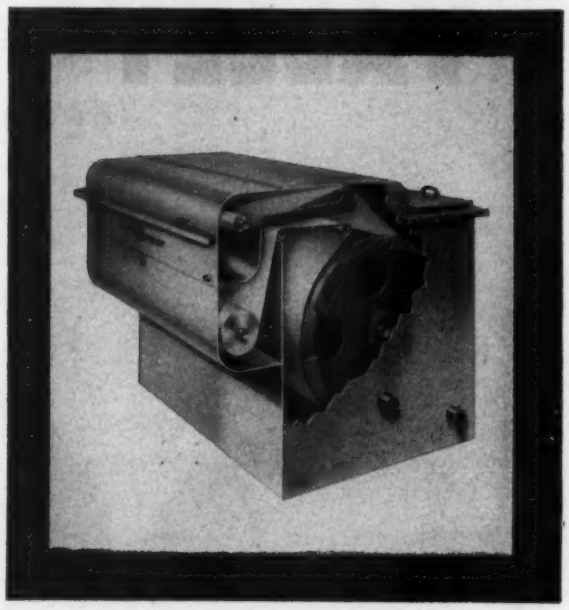
The retention agents are high molecular weight, water-soluble polymeric substances (e.g. homopolymers of B-N, N-dimethylamino), ethyl methacrylate quaternized by ethylene oxide. The polymers have molecular weights of several million.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Container for cigarettes	Juan A. Planas	2,833,455	4/8/58
Paperboard containers	West Virginia Pulp & Paper Co.	2,833,456	"
Display cartons	Robertson Paper Box Co. Inc.	2,833,457	"
Folding trays	New Haven Board & Carton Co.	2,833,458	"
Set-up box and blank	Sherman Paper Products Corp.	2,833,459	"
Paper bag having a flared folding top	Michael A. Votolato	2,833,460	"
Easy opening folder	Container Corp. of America	2,833,461	"
Recording paper for spark recorders	Schoeller & Hoesch	2,833,677	"
Window frame envelope	Double Envelope Corp.	2,834,135	5/13/58
Multiple form machine for making paper boxes	International Paper Box Machine Co.	2,834,261	"
Blank hold-down apparatus	Raymond A. Labombardo	2,834,262	"
Box stripping and extracting apparatus	International Paper Box Machine Co.	2,834,263	"
Carton set-up machine	Federal Paper Board Co. Inc.	2,834,264	"
Apparatus for folding corrugated cardboard shields for packing cases	Earl E. Crist	2,834,265	"
Log barking machine	Anthony Bradenthaler	2,834,385	"
Collapsible shoe boxes	Diamond Gardner Corp.	2,834,460	"
Shipping and display container	John L. Dusseault	2,834,461	"
Can Carrier	A. Geo. Schulz Co.	2,834,508	"
Chick shipping container	Patent & Licensing Corp.	2,834,530	"
Tamper-proof carton	Diamond Gardner Corp.	2,834,531	"
Dual-opening display cartons	David D. Davis et al	2,834,532	"
Paper cup with removable handle	American Can Co.	2,834,533	"
Use of polyalkylene-polyamine resin in paper manufacture	American Cyanamid Co.	2,834,675	"
Variable speed power transmission for paper machinery	Black-Clawson Co.	2,835,144	5/20/53
Screening apparatus for use in papermaking	Black-Clawson Co.	2,835,173	"
Tray forming machine	United Biscuit Co. of America	2,835,174	"
Carton	F. B. Redington Co.	2,835,378	"
Carton carrier	Edlo Inc.	2,835,382	"
Article carrier	Federal Paper Board Co. Inc.	2,835,408	"
Milk carton pitcher	John T. Anderson	2,835,414	"
Carton liner	Delamere Co. Inc.	2,835,428	"
Collapsible container for bakery goods	Fibreboard Paper Products Corp.	2,835,429	"
Carton	William P. Frankenstein	2,835,430	"
Fibreboard shipping box	Secretary of the Army	2,835,431	"
Ventilated packing box	Empaques de CartonTitan, S. A.	2,835,432	"
Self-contained banking envelope	Berlin & Jones Co. Inc.	2,835,434	"
Packaging blank	Charles D. Mullinix	2,835,435	"
Banking envelope	Curtis 1000 Inc.	2,835,512	"
Chest-type container	General Mills Inc.	2 835 594	"
Dispensing box	Dow Chemical Co.	2,836,292	5/27/58
Telescopic shipping carton	Green Bay Box Co.	2,836,338	"
Produce display tray	Virgil T. Pringle	2,836,339	"
Box	George C. Nydegger et al	2,836,341	"
Carton	Diamond Gardner Corp.	2,836,342	"
Tear strip for opening cartons	Fund-Del. Inc.	2,836,343	"

BELOIT UNIT MODERNIZATION

ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS



PATENTED

Lubrication costs excessive?
Sludge deposits a problem?

Consider these advantages found in

Beloit Roll-Filter Lubrication System

Prompt, efficient filtering (no sludge deposits). Filtering medium can be renewed in minutes by one man (automatic if desired). Initial as well as replacement oil costs are held to a minimum. Clean, easy to maintain.

A patented Beloit Roll-Filter is available for any gallonage requirement—from 30 gpm systems to 100 gpm systems. Requires little space!

» **ACT!** *Write for specific information about a Beloit Roll-Filter Lubrication System to meet your needs. Write to Beloit Iron Works, Beloit, Wisconsin.*

100 YEARS

BELOIT

PAPER MACHINERY

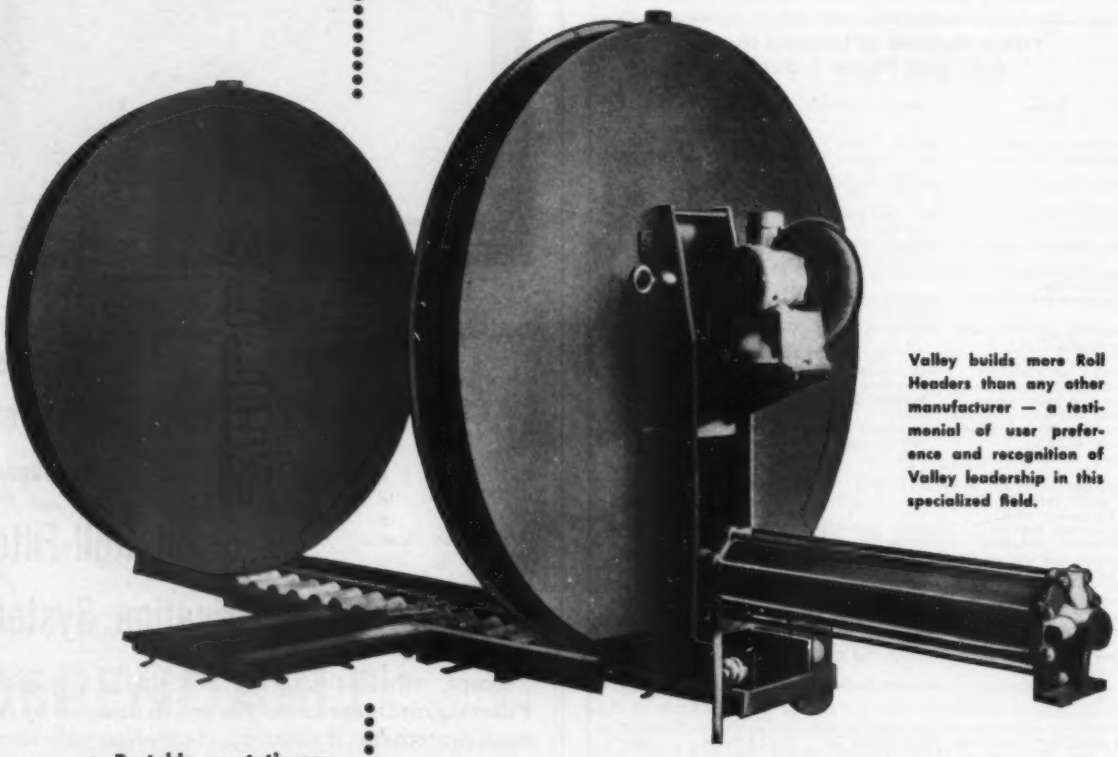
your partner in papermaking

VALLEY

ROLL HEADERS

make it very costly

to head rolls by hand today!



Valley builds more Roll Headers than any other manufacturer — a testimonial of user preference and recognition of Valley leadership in this specialized field.

- Portable or stationary units.
- Any desired size.
- Available with automatic operation for high production.
- Furnished with or without scale.
- Cold, steam or electrically heated platens.

Substantial savings through cost reduction have resulted in mills using the Valley Roll Header. Heading time has been cut up to 40% . . . plus turning out a much more neatly packaged product. We have installations throughout the U.S.A., handling many different kinds of paper and different size rolls. Just drop us a line requesting the full story on Valley Roll Headers.

VALLEY IRON WORKS CO., Appleton, Wisconsin

Canadian Representative: Pulp and Paper Mill Accessories Ltd.,
P. O. Box 903, Station "Q" Montreal 9, Quebec

FOREIGN ABSTRACTS

Degradation of rayon pulps on storage

Two dissolving pulps used in rayon manufacture were stored over periods of 49-53 days in a conditioning room at 20°C and 65-per cent relative humidity. In the case of one pulp (A) there was a gradual decrease in the viscosity of the original material as well as of the alkali cellulose and the viscose prepared from A. In another pulp (B) there was a slight increase in the viscosity of the cellulose regenerated from the alkali-cellulose prior to aging, but this was also followed by a decrease in viscosity toward the end of the storage period. During storage there was also a slight and very gradual improvement in the filterability of the viscose solution, which was not ascribed to the decrease in viscosity.

The conclusion is reached that the viscosity effect observed probably results from a preferential attack on the longer chains in the cellulose, but that there may be another initially over-riding effect (as in pulp B) attributable to the simultaneous degradation of certain short chain fractions.

This is one of a series of papers resulting from viscose pilot plant experiments carried out in the Norwegian Pulp and Paper Research Institute in Oslo.

Thirteen references and two tables. ϕ Ellefsen and E. A. H. ϕgaard. *Norsk Skogind.* **12**, 255-8 (1958) (in English).

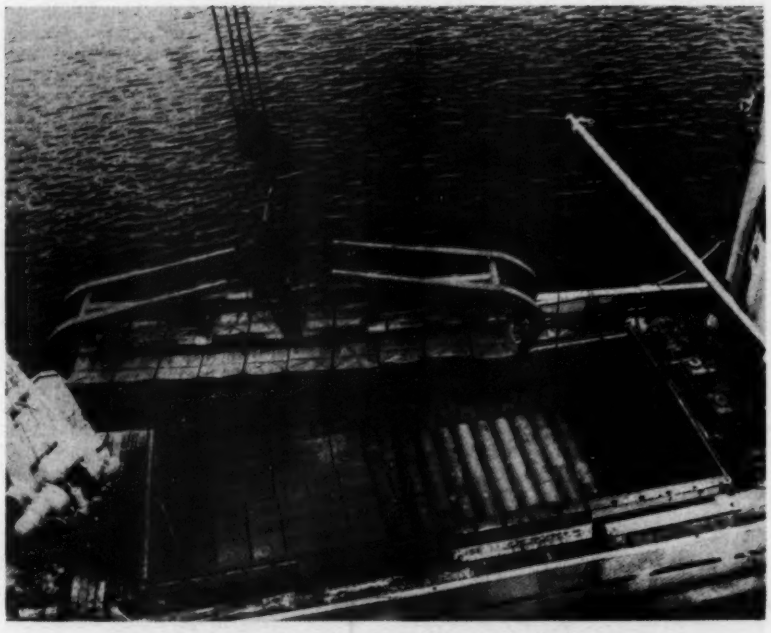
Deodorization in a kraft mill in Milan

The effluents from sulfate digesters and black liquor recovery systems were analyzed and showed to contain an average of 23 milligrams per liter of mercaptan and 25 milligrams per liter of hydrogen sulfide. These corresponded to about 60 kilograms of the former and 70 kilos of the latter *per diem* for an average effluent volume of 100-120 cubic meters per hour. Chlorine deodorization presented such high costs that a partial deodorization with air was developed that proved more economical.

In laboratory experiments the effluent was acidified, and a ratio of air to this effluent of 120-to-1 was used. This caused almost complete oxidation of the hydrogen sulfide and over 50 per cent oxidation of the methyl mercaptan. This was followed by additional treatment with chlorine, which required only 10 to 30 per cent of that required normally, when no air was used. Various aeration towers were used in the pilot plant experiments; these included the spray-type, flow-plate and Raschig towers. The latter gave the best results. With the Raschig towers about 98 per cent of the hydrogen sulfide and 50 per cent of the mercaptans were removed.

After these experiments a deodorizing plant was set up in the Cartiera Vita Mayer & Cie in Milan. The effluents were acidified to pH 6 with sulfuric acid and pumped into the tower, and after this preliminary treatment residual gases were oxidized with a chlorine solution from the bleach plant and discharged into the river. The air from the Raschig tower was transferred to the oxidizing towers of the black liquor recovery system, in which 100 per cent of the hydrogen sulfide and 95-99.5 per cent of the mercaptans were oxidized.

Six figures and 13 tables are included. P. Colombo, D. Corbetta, S. Pirotta and A. Sartori. *Assoc. tech. ind. papetiere Bull* No. 5, 177-84 (1957) (original in French) through *Abstr. Bull. Institute Paper Chemistry* **29**, No. 1, 3 (Sept. 1958).



New method for handling pulp bales

Pulp bales at the Skoghall mills are assembled in unit loads of 20 (representing four metric tons) immediately after coming from the baling press and tying machine. These unit loads are taken to pulp storage at the quay-side by means of a straddle truck equipped with a special clamping device that can take the 20 bales directly from a floor without use of pallets or bolsters.

In the storage builings the unit loads are handled by overhead cranes equipped with a 35-ft. horizontal turning arm. The cranes can handle the 20 bales at one time by means of a specially-designed bale grab that serves to clamp the unit loads at each of the short ends of the 2 × 10 bale arrangement with the bales standing end up. In this way, the storage surface and volume can be effectively utilized. The cranes can also take unit loads directly from storage into the hold of a ship (see photo) or place them on railroad flat cars. One crane, of the type mentioned, can deliver 70-80 metric tons per hour to a ship's hold. Thus shiploading is made safer, and stevedore crews can operate to better advantage than when the usual boat winches are used in hoisting pulp. The grab details are described fully with suitable illustrations.

Seven figures and four references. Erik Sundblad. *Svensk Papperstidn.* **61**, 504-508 (1958) (in Swedish with English summary).

Alkaline treatments of cellulose

This is one of a series of articles from the State Institute for Technical Research in Helsinki that deals with accessibility of various types of cellulose to alkali. The materials treated were cotton linters bleached with a degree of polymerization (D.P. of 812); a bleached sulfite pulp (D.P. 1043), and a viscose rayon pulp (D.P. 219). In every case these were treated with sodium hydroxide solutions ranging in concentration from 0.001-5.0 Normal (7 different concentrations), both at 25°C and at the boiling point of the solution.

The effects of these treatments on the apparent percentage carbonyl and carboxyl

groups in the original cellulose, the amounts of material dissolved, the D.P. values, the x-ray characteristics and the water-vapor capacities of the treated samples were studied. It was found that as the alkaline concentrations increased, especially above 0.1 Normal, there was a marked apparent loss in both the percentage carboxyl (determined as base-binding capacity) and carbonyl. In the case of the bleached sulfite pulp, these losses reached over 60 per cent when the alkali concentration reached 5 Normal. The changes in D.P. were relatively slight. The x-ray studies indicated that in the case of the linters, the diagrams were little changed until the cellulose had been treated with the highest alkali concentration, whereupon the cellulose I changed to cellulose II. A very similar effect was noted in the case of the bleached sulfite pulp. Inasmuch as the viscose pulp was already in the form of cellulose II, the x-ray diagrams of this showed little or no change with increasing alkali concentration.

In general, the sorptive capacity of the cellulose to water vapor increased as the result of alkaline treatment with 5 Normal solutions. This is the alkali concentration which causes the greatest reduction in "accessibility". This "accessibility" is that of the functional groups (especially the carboxyl) in the cellulose. It was also found that when the three types of cellulose were immersed in solutions of calcium thiocyanate (ranging from 0.1-5.0 Normal) the marked swelling effect and the accessibilities of the functional carboxyl group were greatly diminished. The authors explain the behavior of cellulose on alkaline (or on calcium thiocyanate) treatment somewhat as follows:

The swelling pressure causes a widening of the matrix cavities of the fibrils and concomitantly "presses together" both the so-called crystalline and the non-crystalline lattice areas of the cellulose chains between the matrix cavities. They warn, however, that there are other influences at work besides these swelling pressures. Purely chemical and thermal energy effects are invariably active during the course of the alkaline treatments and cannot be ignored. However, any interpretation of functional group determinations after alkaline treatment should be made with due caution. The markedly different changes in cellulose solubility are shown in the accompanying figure.

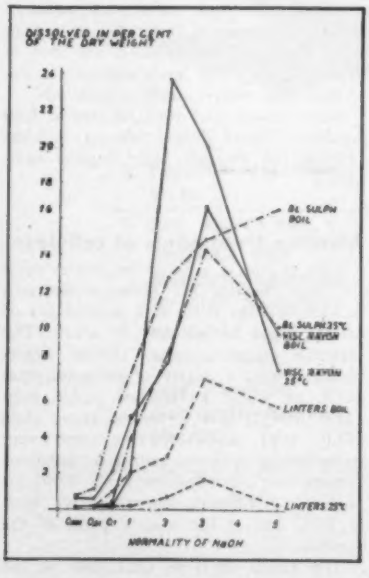


Fig. 1

Eight tables, six figures and 10 references are given. Olli Ant-Wuorinen and Asko Visapaa. *Paper and Timber* (Finland) 40, No. 6, 313-321 (1958) (In English).

Radio-actively labelled pulp fibers

About 20 gr. of the fibers (on the dry basis) were soaked in water for at least 4 hrs., processed in a laboratory disintegrator for 25 min., poured into a Bauer-McNett classifier and washed 1 hr., using 28-, 48-, 100- and 150-mesh screens, thus removing the fines. The fiber fractions were then combined and added to a 0.5*N* silver nitrate solution so that a 1-per cent suspension resulted. This was stirred 1 hr., filtered by suction and then dispersed in a saturated sodium chloride solution. This mixture was then treated 20 min. in a disintegrator to remove any loosely-held silver chloride, and the treated fibers were then washed thoroughly (as above) is the classifier.

This phase of the process is termed "chloridization". When satisfactorily carried out, it yielded fibers that, when a small sample was treated with a photographic developer, turned gray or black. When only lightly chloridized, fibers have to be recycled. The treated fibers were tagged with iodine[131]. Either 1- or 20-gr. pulp samples could be used. When 1-gr. samples were used, these were slowly stirred with 50 cc. sodium iodide, which contained 0.1 gr. inactive NaI, 1 cc. 0.1*N* sodium hydroxide, and 6 - 20 microcuries of NaI[131]. During the stirring operation small samples of the suspension were removed from time to time and examined for "pick-up" of the radioactive iodine, which formed silver iodide by anion-exchange. After about 1 hr., the filtered fibers were washed thoroughly and freed from any adhering solution. The percentage pick-up and of retention were determined in the case of various groundwood samples, kraft, bleached soda and unbleached sulfite pulps. The silver iodide is held within the lumina of the fibers, and these tagged fibers can be converted readily into paper sheets that form an ideal mounting medium for radio-active counting and for the preparation of auto-radiographs.

Fig. 2 shows a bleached soda fiber with a very heavy silver iodide deposit in the fiber lumen. Fig. 3 shows a typical auto-radiograph, which in the original illustration clearly showed the fiber lengths and shapes in the handsheet. The following appear to be advantages of the present tagging method over others. The content of tagged fibers in a fiber suspension can be determined quantitatively by subsequent conversion into a sheet. Fibers that are *below* the sheet surface and that are tagged will register on the counter almost as readily as those that are *on* the sheet surface (this is different from the case of dyed fibers). Some idea of the distribution of the tagged fibers throughout the sheet is indicated by the differences in sharpness of focus of the fibers in the auto-radiograph. Clumping of fibers (which may occur in high concentrations of tagged fibers) should be prevented. A proportional flow-counter is described with an adequate sketch.

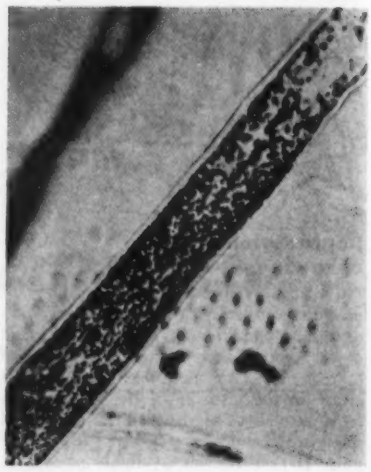


Fig. 2

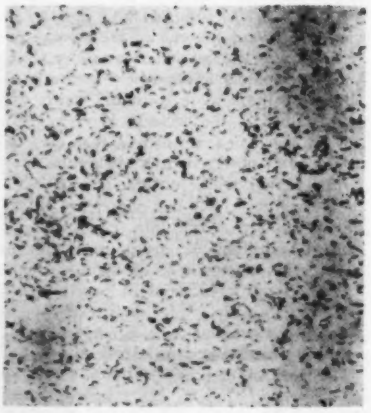


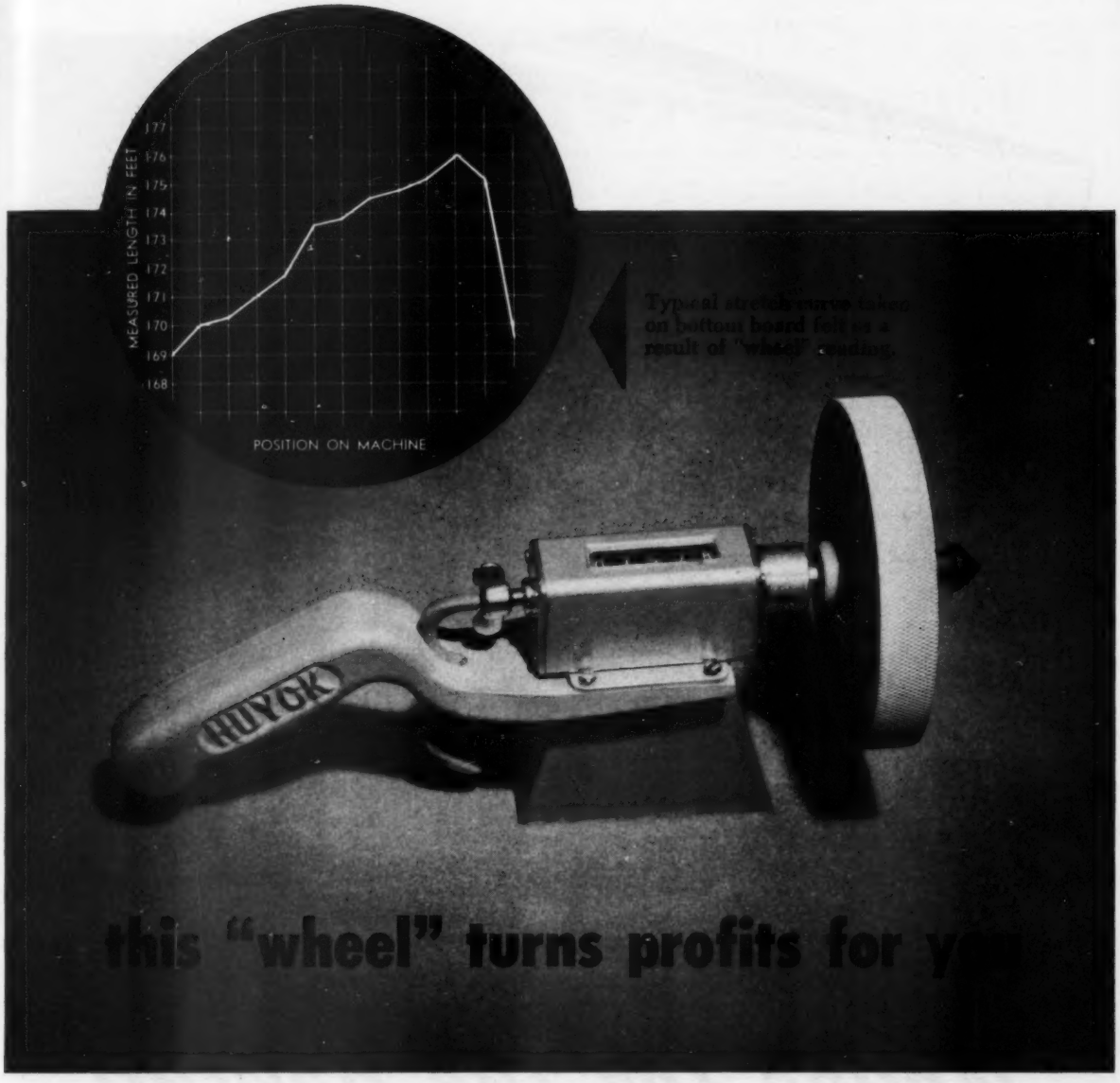
Fig. 3

Four references, eight figures and two tables are included. G. A. Allen, A. Rezanowich and S. G. Mason. *Svensk Papperstidn.* 12, 475-80 (1958) (in English).

Fillers used in paper and board

This is largely a descriptive resume. The loading materials treated include barium sulfate, Satin white, kaolin, magnesium silicate, diatomaceous earth and titanium oxide. Retention and covering power are considered very briefly.

Ten references and one table. A Rettori. *Papeterie* 80,No.7, 492-3; 495-6 (1958) (in French).



Pictured above is the new '59 model Kenwood Felt Measuring Wheel used by Huyck Sales and Field Service Engineers to (1) determine whether felts are running at proper operating tension and (2) gather vital data bearing on felt design and service life. Just one of many new precision tools provided *only* by Huyck, the "wheel" shortens the distance to better production of better paper at lower felt cost per ton.

HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
Division of F. C. Huyck & Sons.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario

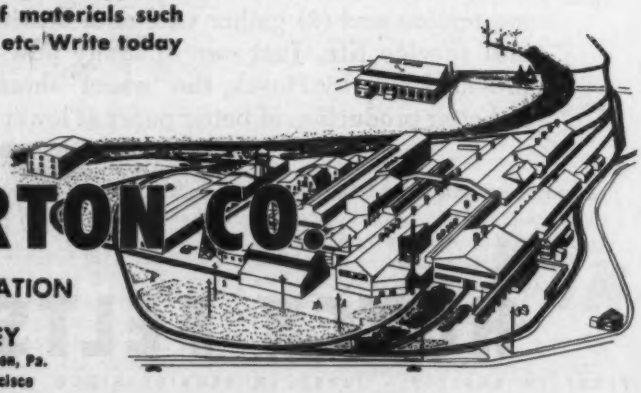
NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

16 PAGES PACKED FULL OF CHAIN DATA IS . . .

Yours for the asking

TISCO Manganese Steel Chain has no rival for long wear and rough use. All popular sizes and types of chain are shown for handling of materials such as ores, sand, gravel, pulp wood, etc. Write today for this complete FREE Catalog.



TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION
Established 1742
HIGH BRIDGE 5, NEW JERSEY
PLANTS: Cincinnati, O. — Birmingham, Ala. — Easton, Pa.
SALES OFFICES: New York — Chicago — San Francisco

NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Adhesive

A new adhesive called Doublegrip has been developed for the printing industry.

Doublegrip was developed for adhering rubber mats to printing cylinders. The adhesive is applied to both the rubber mat and the cylinder and allowed to dry for a few minutes. When dry, the rubber mat adheres tenaciously on contact. *Adhesive Products Corp.*

Circle No. 11 on Readers' Service Card

Pressure transmitter

An absolute pressure transmitter, accurate to 0.5 per cent of full scale, is now available.

A force balance instrument, the new Type 13AA d/p cell transmitter produces a 3-15 psi linear signal proportional to absolute pressure. *Foxboro Co.*

Circle No. 12 on Readers' Service Card

Duplex rewind slitter

A new duplex rewind slitter, featuring slip clutches operating on a spinning reel principle to minimize tension, has been introduced. The model (BD-S-24) is available with either score cut or razor blade slitting stations.

In operation, the material is fed through the machine by a pair of nip rolls whose pressure is controlled manually. Therefore the duplex rewind shafts have only to take up the slit material with enough tension to insure a uniform roll. *Appleton Machine Co.*

Circle No. 13 on Readers' Service Card

Plastic stock protector

On a request from one of the Midwest's largest paper manufacturers, Polo Plastics Co. has developed a rugged stock protector fabricated from heavy-duty frosted vinyl.

The waterproof stock protector serves a manifold purpose. Aside from making bulky canvas and makeshift wrapping paper obsolete as stock protectors, this new protector safeguards the moisture content of the paper, keeps it free of dust and foreign particles that may settle during the night and provides a convenient and quick way of protecting opened but partially-used skids.

The vinyl protectors are available for silk-screened advertising. *Polo Plastics Co.*

Circle No. 14 on Readers' Service Card

High-velocity dryer

A complete laboratory air knife coating line featuring a 10-ft.-long high-velocity air dryer has been installed by Frank W. Egan & Co.

This new installation is the result of a development program and will be used for experimentation and demonstration.

It is said that the dryer will take an 18-in. web, attain speeds up to 1000 fpm and handle light papers to heavy paperboard. *Frank W. Egan & Co.*

Circle No. 15 on Readers' Service Card

Spot welder

A new spot welder, called the Impco Face Welder, for applying and repairing stainless steel face wires and bands has been developed.

Simple settings and an automatic timing feature make the welder very easy to operate. It incorporates extra-heavy relay contacts, an accurate timer that automatically governs the welding cycle and silver-plated contact surfaces.

The unit requires a minimum power supply of 95v during its welding cycle. It contains a volt meter that permits the operator to check the voltage during operation. *Improved Machinery Inc.*

Circle No. 16 on Readers' Service Card

Remote bulb temperature control

The Type E27A remote bulb temperature control, now on the market, contains two switches and may be used in place of two separate single-switch controls in many applications.

Models are available with range spans of 100°F or 200°F between limits of −150°F and 650°F and with on-off differentials of approximately 1° and 2°F. An adjusting screw is attached to each switch

And they'll stay down with Magliner magnesium dock boards on the job! Magliners speed loading, eliminate dock congestion . . . get extra work from power trucks and other loading equipment. Magliners are magnesium-light—easy to put down . . . easy to move. No heavy lifting . . . no injury hazards. Men, loads and equipment move *fast, sure, safe*. Magliners are magnesium-strong, too . . . built to take it . . . safely handle loads up to 20,000 lbs. Low initial cost. Less maintenance. Dependable long-life service. *Economy* and *cost-savings* right down the line! Put all these advantages to work for you. Put Magliners on your dock!

Write for Bulletin DB-204
MAGLINE INC., P. O. Box 000
PINCONNING, MICHIGAN

MagLiner MAGNESIUM DOCK BOARDS

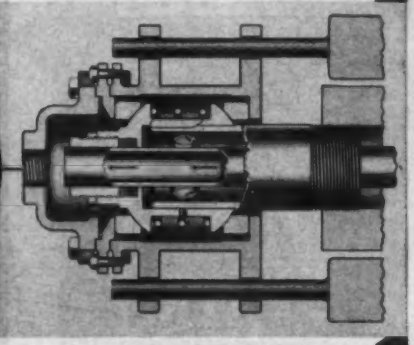
Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario

For High Speed Paper Machines with Revolving Syphon Pipes

In the Type LN Johnson Joints the revolving syphon pipe is made a part of the rotating assembly, yet is permitted longitudinal movement. Sealing is still accomplished without packing. Simple support rods carry all the weight of joint and connections, permit the rotating assembly to "float" freely inside. Special hangers and brackets adapt the mounting for machines with either open or enclosed gearing.

Johnson Joints fit all needs on paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses. For full data on Type LN write for Bulletin N-2002.

Type LN Johnson ROTARY PRESSURE Joints "First in the paper industry"



THE JOHNSON CORPORATION
845 Wood St., Three Rivers, Michigan

New Products . . .

so that each switch can be adjusted individually up to a maximum span of approximately 15°F between switch settings. *United Electric Controls Co.*
Circle No. 17 on Readers' Service Card

Core cutters

A complete line of core cutters of Sonoco and Cameron design will be manufactured. The line includes units suitable for cutting all types and sizes of paper cores and tubes for use in the paper, film, foil and general converting industries.

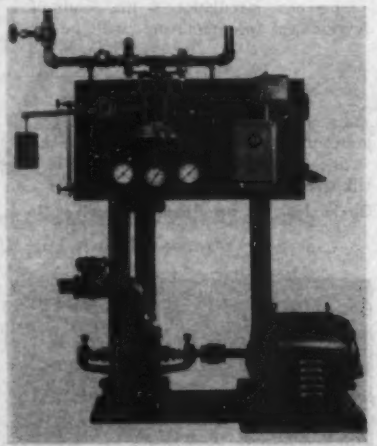
The cutter units range from models for precision recutting "one-at-a-time" to semi-automatic gang cutters and heavy-duty mill type cutters. *Cameron Machine Co.*
Circle No. 18 on Readers' Service Card

Casein products for paper manufacturing

Two new casein products for the paper manufacturing industry have been announced.

One is a water-soluble casein known as Borden's Protovac PV-424. It was designed especially for use as a latex stabilizer. The other product, Borden's special 30-mesh Argentine casein, is particularly suited for paper coating and other uses demanding a high-quality casein.

Data sheets are available from the company. *Borden Chemical Co.*
Circle No. 19 on Readers' Service Card



Boiler return system

Better performance with lower operation and maintenance costs are claimed for an improved differential drainage and boiler return system.

The system is designed for wherever steam is used for processing at pressures over 30 lb.

New features include a two-stage pump to replace the dual pump arrangement formerly used, new floatless liquid level control, chrome-plated pump internals and teflon packing in differential valve.

The system is said to return condensate from steam processing units to the boiler at 300° or higher—only 15-20° less than the temperature at operating pressure. This lowers fuel costs 10-25 per cent over the usual open system. Raw make-up water needs are reduced up to 90 per cent, thereby minimizing corrosion and boiler strain.

Patented differential valve automatically maintains any desired differential in pressure between steam in the boiler and pressure in the system's receiver tank. Since the system requires only 25-lb. pressure differential, power required for pumping is reduced about 75 per cent. And with higher, more uniform boiler pressure and higher temperature steam, processing units operate at peak efficiency. *Stickle Steam Specialties Co.*
Circle No. 20 on Readers' Service Card

Safety solvents for cleaning and degreasing

A line of general-purpose rapid-drying safety solvents is now being offered to the industry.

One of these solvents is the cleaner and degreaser (KO9) for electrical equipment. It is especially useful in cleaning motors. The motor, while running, is submerged in this cleaner. The manufacturer states that no matter how wet, greasy or fouled

up the motor is, it will come out clean, and the solvent adhering to the motor will evaporate in a few minutes. *KOR Corp. Div., OXI Corp.*

Circle No. 21 on Readers' Service Card

Liquid level controller

A liquid level controller to handle measurements involving corrosive or heavy viscous liquids is now being marketed.

The company states that with the Type 115 floatless level controller hard-to-handle liquids come into contact only with the diaphragm and diaphragm ring, thereby eliminating the danger of a corroded or clogged measurement element. The unit transmits a pneumatic output signal that is equal in magnitude to the head pressure resulting from the liquid in the vessel. *Fisher Governor Co.*

Circle No. 22 on Readers' Service Card

Suction box cover

A new end-of-grain suction box cover that is constructed of winter-cut hard maple is now being offered. Called the Lo-Vac, the cover is said to produce a wax-like surface that is kind to the wires.

The lands are supported on cross members of Reslin laminate that does not contract or expand. The cover is fully soaked and ready to place in service. *Appleton Wood Products.*

Circle No. 23 on Readers' Service Card

Adhesive

The use of a rapid-drying, short tack range adhesive has been developed to help make possible the automatic process of bonding paper to formed aluminum strips in the production of corner beads for dry wall construction. *Adhesives, Coatings & Sealers Div., Minnesota Mining & Mfg. Co.*

Circle No. 24 on Readers' Service Card

Lightweight corrugators tapes

Two new improved lightweight corrugators tapes have been developed. These tapes, "55" and "K-21", are said to have all the characteristics of regular weight tapes and the plus features of lightweight tape economy, fewer roll changes and superior working qualities on automatic taper equipment. *Nashua Corp.*

Circle No. 25 on Readers' Service Card

Combination vise and vise stand

Two new combination vise and vise stands have been developed for piping. The new vise stands are said to contain several new features and are known as the 7C with chain vise, ⅛-5 in., and the 7Y with yoke vise, ⅛-2½ in.

Both stands have a sturdy steel folding tray that prevents collapsing. The large vise bases have three pipe benders located over the rear leg, eliminating tipping when bending pipe. *Toledo Pipe Threading Machine Co.*

Circle No. 26 on Readers' Service Card

Film adhesive

Double-Face, a pressure-sensitive translucent film adhesive that has been developed, is said to be an excellent medium for laminating open and closed-cell foam materials such as vinyl foam, polyurethane foam, polyester foam and rubber foam. *Angier Adhesives, Interchemical Corp.*

Circle No. 27 on Readers' Service Card

Container resists skidding

A corrugated container that resists skidding has been introduced. Non-skid proper-

Kalamazoo Glazed Tile Tanks

Designed for the Paper Industry

6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

• Save Initial Costs
• Eliminate Costly Maintenance

thru this NEW CONCEPT in MEASURING FLOW thru PARSHALL FLUMES

with a
BURGESS-MANNING TYPE "ML" METER INSTALLATION

You completely eliminate such installation costs as: excavation for dry well; concrete dry well foundation and walls; metal float well and cover; connecting telltale piping, valves and fittings between Parshall Flume and float well; float cable and protecting piping; clear water piping and fittings for back-purge system, and metal grating to cover dry well.

And, most important, the only maintenance you will have is the possible hosing off, in a few seconds, of the float once in many weeks. Receiver may be located up to 5000 feet from transmitter.

Write for Burgess-Manning "ML" Meter Bulletin.

Think of the savings! Think of the elimination of maintenance!

BURGESS-MANNING COMPANY
Penn Instruments Division
4106 Haverford Ave., Philadelphia 4, Pennsylvania

ROGERS
KNIFE GRINDERS
HEAVY DUTY SERIES 220

Pictured is standard 210" Model 220 equipped with 15 HP Motor and 20" Segmental Grinding Wheel.

Rogers Heavy Duty Model 220 Grinder furnished in sizes from 78" to 240" with mechanical or hydraulic drive. Grinding Heads from 10 HP to 40 HP with segmental grinding wheels from 16" to 30" diam. Rogers Grinders have guaranteed built-in accuracy to produce the best grinding results. Many models and sizes from which to choose. Write for complete information.

SINCE 1887
SAMUEL C. ROGERS & CO., INC.
2070 SHERIDAN DRIVE • BUFFALO 23, NEW YORK

New Products . . .

ties have been built into the board at the paper mill.

The new containers are designed to decrease produce damage caused by container skidding and slippage on production lines, in transit, in handling and in warehouse operations. *Packaging Div., Olin Mathieson Chemical Corp.*

Circle No. 28 on Readers' Service Card

Diaphragm-type pumps

A new line of diaphragm-type pumps has been introduced. Available in both single- and double-stage models in a range of pressures and capacities, the new pumps are especially designed to handle corrosive liquids such as acid, alkalines, oils, etc. They are also well-suited to handle thick solutions or slurries containing heavy materials in solution such as clay glaze, paint, etc. *Schweitzer Equipment Co.*

Circle No. 29 on Readers' Service Card

Transistorized preset counter

A new transistorized preset counter for highly-accurate industrial counting and control functions has been developed.

The unit, called Dynaset, is reported to provide the highest degree of reliability because there is virtually nothing to wear out. Direct readout is also available through in-line neon tubes that continuously display illuminated numbers on separate tube faces readable from 50 ft. away. *Dynapar Corp.*

Circle No. 30 on Readers' Service Card

Framing angle

The development of a new versatile framing angle, fabricated from cold-rolled galvanized steel, has been announced.

The new material, AIM brand slotted angle, has a precision-engineered recurring pattern of slots and holes to provide speed and convenience in assembly. It is also said to have maximum structural strength and rigidity. *Acme Steel Co.*

Circle No. 31 on Readers' Service Card

Glass fabric conveyor belt

A non-stick, Teflon-coated glass fabric conveyor belt has recently been introduced to solve the problems of heat and sticky materials in industrial handling.

The chemical and solvent resistance, high and low temperature characteristics and the anti-adhesive, anti-friction properties of Teflon-coated glass fabric belting suggest many diversified applications. *Quaker Rubber Div., H. K. Porter Co. Inc.*

Circle No. 32 on Readers' Service Card

Liquid ratio regulator and blender

The type R liquid ratio regulator and blender is said to represent a new concept in flow measurement, ratio control and the actual blending.

Present units are suitable for relatively low-capacity secondary flow rates with practically no limitations on the maximum flow of the primary stream, and the line is rapidly being extended to cover higher secondary flow rates. *W. A. Kates Co.*

Circle No. 33 on Readers' Service Card

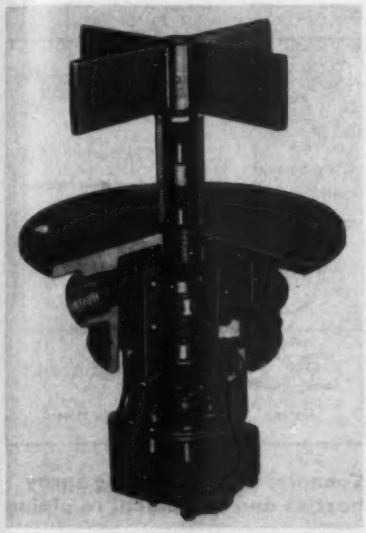
Impulse steam trap

An impulse steam trap has been designed especially for light condensate load applications.

Known as the Yarway No. 30, the steam trap is said to be ideally suited for

use on steam tracer lines, steam main drips, small platens and other applications with light condensate loads. It is available in ½-in. size only for operating pressures 8—600 psig. *Yarnall-Waring Co.*

Circle No. 34 on Readers' Service Card



Level control for bulk bins

Pictured above is a new Bin-Vue level indicator and control that features an easy-off cover and a fail safe device.

In operation, a 1/100-hp motor turns a four-blade paddle at 9 rpm by means of a torsion spring. The paddle turns continuously as long as no material touches it. When material makes firm contact with the paddle, the paddle stops. The motor continues to run, turning the spring until it activates a limit switch. The switch kicks off the motor and any other equipment connected to the indicator. *Convair.*

Circle No. 35 on Readers' Service Card

Industrial dehumidifier

To meet rigid requirements for continuous low-volume drying of air, gas or liquids, a new industrial dehumidifier has been developed.

This Model A12 (pictured above) is a self-contained unit, completely automatic and may be installed either inside or outside the space to be controlled. The unit is available with humidistat controls for use in a room or with a constant-humidity regulator for maintaining close tolerances in a cabinet, oven or stream of air. *Universal Dynamics Corp.*

Circle No. 36 on Readers' Service Card

Pipe cutters

A new line of pipe cutters designed to give cleaner, straighter cuts than ever before is now in production.

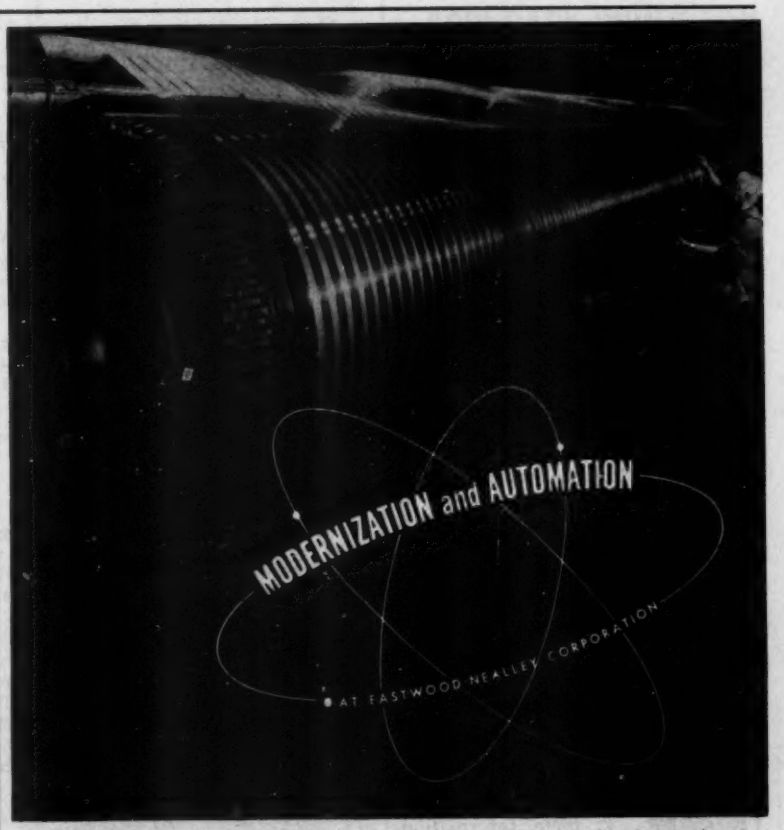
Many improvements have also been made in the new design. These cutters are available in four models: No. 10, ⅛ - 1½ in.; No. 20, ⅛ - 2 in.; No. 201, ⅛ - 1¼ in., and No. 202, ⅛ - 2 in. No. 201 and No. 202 have extra-wide rollers and can be used by hand or with power. *Toledo Pipe Threading Machine Co.*

Circle No. 37 on Readers' Service Card

Baler

A new baler called the Mark 1-43 in. has been developed. This new press is mounted on roller-bearing casters for portability. The power package is all hydraulic. There is nothing to lubricate, nothing to adjust in the baler, no installation expense, and the press is completely self-contained.

The horizontal design permits the operator to charge materials into the oversized hopper from any direction. Materials



This is the back beam of the largest fourdrinier wire loom in the world. Before it begins to weave, weeks must be spent "dressing" it with the wire that will be woven into the cloth that makes paper. Twenty thousand pounds, or 90 MILLION feet of warp wire must be wound carefully on this huge cylinder. Great machines such as these are custom built by Eastwood-Nealley, and their performance is guarded every instant by electronic controls. **This is part of our modernization and automation program designed to benefit the manufacturer of paper.**

EASTWOOD-NEALLEY CORP.
BELLEVILLE NEW JERSEY

Save Man Hours

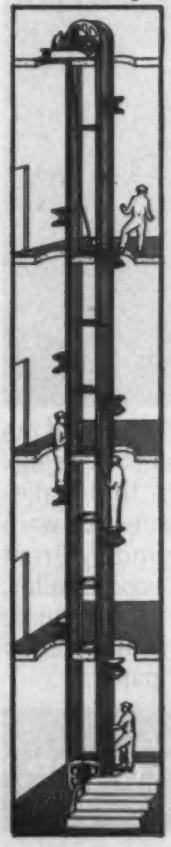
Equip Your Digester House with a

HUMPHREY

Employee's Manlift

ELEVATOR

Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.



Can be installed in any Multi-Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY

Inc.

344 1st Ave. N.W.

Faribault, Minnesota

Humphrey is the original Manlift Elevator, made continuously since 1887.

New Products . . .

can also be fed into the press by a conveyor or through a chute from the floors above. One control lever makes for effortless operation. *Lake Engineering Co.*

Circle No. 38 on Readers' Service Card

Glass for chemical service

A new tough glass called Glasteel 59 said to have 30-per cent greater resistance to thermal shock has been introduced to the industry.

Glasteel 59 presents a new glass for the entire chemical industry, offering extended corrosion service life and 20-per cent greater resistance to abrasion. *Pfaudler Co. Div., Pfaudler Permutit Inc.*

Circle No. 39 on Readers' Service Card

Chain lubricant

A synthetic chain lubricant called Anderol L-732 is now being marketed. This new material is said to effectively overcome the many problems previously associated with chain lubrication.

L-732 is a very tacky, semi-fluid grease. This gives a much longer lubrication period and prevents throw-off and run-off. *Lehigh Chemical Co.*

Circle No. 40 on Readers' Service Card

Tool for logging operations

A new tool for logging operations has been designed for use with Hyster Co.'s Cat D4 tractor and Hyster D4D or D4N winches. The tool is called the D4 Integral Arch.

The arch mounts on the winch drum shaft and is anchored to the tractor by means of backstay struts welded to the track roller frames. Full track oscillation is retained by an equalizer beam that allows movement of the backstay struts to compensate for oscillation of track roller frames. *Hyster Co.*

Circle No. 41 on Readers' Service Card

Compression-type packings

A new line of compression-type packings is now being marketed. Trade named Val-Pack, the line includes both the sheet and rod seal types common to industry. A catalog and ordering data on these packings will be sent upon request. *E. F. Houghton & Co.*

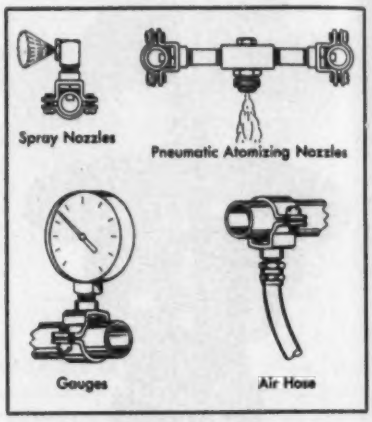
Circle No. 42 on Readers' Service Card

Punching stock varnishes

Plyophen 5888 and Plyophen 5896 are two cold punching stock varnishes that are now available. These varnishes meet the National Electrical Manufacturers Association's specifications for XXXP laminates.

The varnishes are designed to be used with the proper grades of absorbent rag paper, alpha cellulose paper or a modified kraft paper treated for extra absorbency. *Reichhold Chemicals Inc.*

Circle No. 43 on Readers' Service Card



Connectors for mounting spray nozzles and equipment to piping

Designed for liquid, gas and air lines and for pressures up to 250 psi, a split-eyelet connector provides leak-proof connection and over-all simplified mounting of ⅜- and ¼-in. spray nozzles of all types.

Equipment such as gauges or hose may also be easily mounted to lines with these new connectors. *Spraying Systems Co.*

Circle No. 44 on Readers' Service Card

Chemigum latex

A latex-impregnated paper with tear strength, flexibility, wet strength and printability that make it suitable for book covers, auto bumper signs, labels and applications where exposure or wear conditions are severe is currently being produced.

Chemigum latex is used in impregnating the paper.

Saturation of the highly-absorbent stock is accomplished on standard coating equipment. For maximum pick-up, the paper actually is submerged in a latex bath, and excess compound is removed by squeeze rolls as the stock leaves the bath. After drying, the paper may receive a final print coating on one or both sides. *Chemical Div., Goodyear Tire & Rubber Co.*

Circle No. 45 on Readers' Service Card

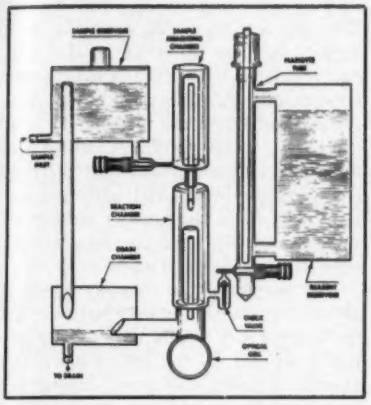
Quick couplers

Here is the OPW-Jordan stainless steel Kamlok quick coupler that is now available from stock. Kamloks are used with hoses, pipes and equipment wherever a quick coupler is needed.

Stainless steel Kamloks are said to provide excellent corrosion and wear resistance needed in many applications. They are available in ½-in. through 3-in. sizes in the popular styles and are suitable for pres-

sures to 200 psi and temperatures to 550°. *Jordan Industrial Sales Div., OPW Corp.*

Circle No. 46 on Readers' Service Card



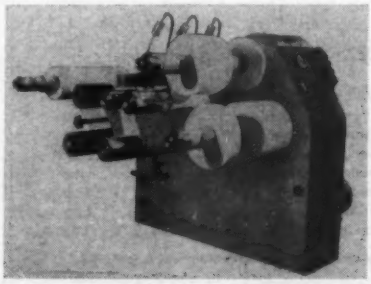
Chemical analyzer

A new chemical analyzer known as the Chemalyzer has been designed with no moving parts and no electric or pneumatic power for operation.

The entire operation of the unit is powered by the gravity head of the entering sample and is continuous and automatic.

A cut-away drawing of this unit is pictured above. *Florida Instrument Co.*

Circle No. 47 on Readers' Service Card



Combination slitter and doctor machine

Designed to cure reject headaches in converting plants handling paper, film, foil or plastics, a new combination slitter and doctor machine is now being offered.

Called the Model 182, it is engineered for versatile use in high-speed rewinding and multiple slitting.

Rewind shafts accommodate web rolls up to 18 in. in diameter and 30 in. wide. Variable speed control permits slitting speeds up to 1000 fpm on variable width and staggered slitting operations. *Stanford Engineering Co.*

Circle No. 48 on Readers' Service Card

Constant-tension unit

A pneumatic constant-tension unit has been introduced. The unit can be applied to converting machines such as printing presses, slitter-rewinders and laminators.

The device is a dancer roll designed for a wide range of tensions and materials. It is air-loaded by remote control and does not require the use of counterweights. *Dills Div., Black-Clawson Co.*

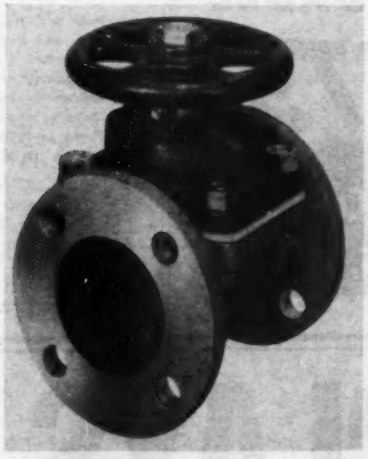
Circle No. 49 on Readers' Service Card

Illuminated indicator measures, transmits and receives

Pressure, draft, differential and level are directly measured, indicated and transmitted by this new gage unit. The unit is also furnished as a pneumatic receiver.

Any number of gage units may be mounted adjacent on the same panel to provide multiple indications. Seven-in. indicating scales are available in red, green, blue, yellow and orange, as well as white for emphasizing desired variables. *Bailey Meter Co.*

Circle No. 50 on Readers' Service Card



Penton-lined valves

The new Penton-lined valves are now being offered and are available in cast iron or aluminum bodies.

The valves lined with Penton (a 300°F chemically-resistant plastic) are said to be compatible with glass, plastic, metallic and lined piping. Handwheel, quick-opening air or electric operators are available. Size range is ½- to 6-in. with flanged ends only. *Hills-McCanna Co.*

Circle No. 51 on Readers' Service Card

NOW—CHECK ACCURACY WHILE YOU CHECK MOISTURE!

New Electronic Moisture Registers have first "built-in standard" in a 3-second, portable moisture tester.

NOW DIAL ACCURACY IS ASSURED, even under the extremes of production-line use. With *self-checking standard,* Moisture Register's new Model 5's are checked and adjusted for calibration accuracy right on the job—by any untrained operator. He simply fits electrode to standard. Then with new trimmer he sets dial for perfect alignment. Gives calibration adjustment *in the field.* You get practical accuracy down to 0% ... 3-second spot tests for moisture wherever your product may be. Portable, light weight, battery operated, new rugged construction with miniature tube. Factory-set to your needs.

For faster testing of—

- Paper Stock
- Paperboard
- Insulation boards
- Paper Bags
- Plastics

SEND FOR NEW TECHNICAL DATA and information on 2-week free trial.

ELECTRONIC MOISTURE REGISTER Instruments

Moisture Register Company, Dept. PI
P. O. Box 910, Alhambra, California
Please send data on new Model 5's.

We are testing _____

in moisture range from ____% to ____%

Firm _____

By _____ Title _____

Address _____

City _____ State _____

Supercalender drive at Eastman

(Continued from page 523)

by motor field weakening. Thus, a separate calender-driven auxiliary generator, operated at fixed field, is used to power the windup motor at a voltage that is essentially proportional to paper speed.

The roll diameter range is taken by motor field adjustment. Speed and current are regulated by booster voltage control. The latter also operates as a vernier regulator for small changes in roll diameter as the roll builds up and permits winding oversized rolls by reducing the armature voltage. For any given roll diameter the motor field is fixed; however, it is re-adjusted periodically by the amplistat-powered motor-operated rheostat as the roll diameter increases.

When starting a new core sheet tension is directly proportional to motor current (regardless of magnitude) because the motor field is fixed at the proper value and current is regulated by armature voltage control. Likewise, if the sheet breaks or if the operator stops the supercalender with a partially built-up roll, the motor field will remain at the proper value for that particular roll diameter. Thus, for stalled tension, threading or slow-speed operation the sheet tension will be directly proportional to motor current because the motor field will be set to produce the required torque per ampere for the given size roll.

The system consists of a fast booster voltage regulator and a slower motor field regulator. It is much easier to stabilize than the more conventional type of motor field regulators because it is a constant-gain system, which makes it possible to operate at a higher over-all gain. The booster voltage regulator can then be designed for faster response, for operation over a wider range of motor currents, and for more positive control of motor current and sheet tension. In effect, the system measures the roll diameter and gives essentially the same results as if a rider roll were used to measure roll diameter, but it does this without the mechanical expense and complication.

The booster voltage is regulated at the proper value for any given motor current. The amplistat current regulator compares actual motor current to a voltage obtained from the tension rheostat. The output of the current regulator is superimposed upon the booster voltage regulator and corrects for any deviation in motor current by adjusting the booster voltage. The current regulator operates as a vernier and has no effect on the voltage regulator when the motor current corresponds to the tension rheostat setting and when the motor field is at the correct value for the winding reel diameter. However, under transient or changing conditions, the current regulator will cause the booster voltage to increase or decrease as required to hold the set motor current.

The output of the current regulator also drives the motor field rheostat. In the case of the windup, as more paper is wound on the roll and the diameter increases, the motor current increases. This unbalances the current regulator, which tends to decrease motor voltage and motor current. When the regulator drifts from its operating point a small amount, it runs the rheostat that increases the motor field until the current regulator is again balanced.

Dynamic braking is provided to give a quick stop in the event of a sheet break.

The Trade-Mark of
DEPENDABLE
FELTS
The
WATERBURY Felt Company
SKANEATELES FALLS, N. Y.

Eight Publications for Papermakers

Pulp and Paper, Volume 1 (Casey)	$18.00
Pulp and Paper, Volume II (Casey)	18.00
Paper and Paperboard Making (Williamson)	6.00
Technology of Paper Coating	2.00
Lessons in Papermaking—Part 1	1.50
Lessons in Papermaking—Part 2	1.50
Notes and Observations on Beaters	1.00
Trouble on the Paper Machine	.75

Mail your order with payment to:

The PAPER INDUSTRY
431 S. Dearborn Street, Chicago 5, Illinois

ENGLISH CLAYS AMERICAN

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
6 East 45th Street, New York 17, N.Y.

NEW LITERATURE

Books

HANDBOOK OF ACCIDENT PREVENTION FOR BUSINESS AND INDUSTRY. Second Edition. Published by the National Safety Council, 425 North Michigan Ave., Chicago 11, Ill. Pages: 93. Price: $1.75.

Here is a handbook that illustrates the simplicity of starting accident prevention work in any business. The chapters discuss the conditions to be controlled for safe operation.

Some of the chapter headings include: Planning for Safety; Machine Guarding; Personal Protective Equipment; Industrial Health and First Aid, and Physical Plant.

MODERN CHEMICAL PROCESSES. Volume 5. By the editors of *Industrial & Engineering Chemistry*. Published by Reinhold Publishing Corp., Dept. B-189, 430 Park Ave., New York 22, N.Y. Pages: 154. Price: $5.00.

This is the fifth volume in a series that describes American chemical technology in pertinent detail. It contains 14 recently developed chemical processes—all now in operation.

A new editorial approach has been given to this volume in the way of streamlining the articles, presenting them in the most interesting way and also to keep in mind the busy reader.

TECHNIQUES OF PLANT MAINTENANCE AND ENGINEERING. Published by Clapp & Poliak Inc., 341 Madison Ave., New York 17, N.Y. Pages: 211. Price: $10.00.

This is the ninth volume in a series that reports the proceedings of the annual Plant Maintenance & Engineering Conference, this one held in Chicago last January.

Included in this volume are texts of 35 papers, 450 questions and answers, 42 charts, tables and illustrations. Special attention has been given to the chemical field and to the pulp and paper mills. A new feature is a discussion of maintenance in research and development laboratories.

TIMBER RESOURCES FOR AMERICA'S FUTURE. By the Forest Service, U. S. Department of Agriculture. Published by Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Pages: 713. Price: $7.00.

Periodically the Forest Service has examined the forest situation as part of its over-all responsibility to keep the people and the Congress informed as to timber supplies and outlook. This "Timber Resource Review" is the sixth of these state-of-the-union reports on timber. As was true of each of its predecessors, this report is more comprehensive than any of its forerunners because of improved technical skills and the availability of more information.

Booklets and Pamphlets

PROHIBITED MATERIALS AND OUTTHROWS IN PAPER STOCK is the title of a booklet published by the Waste Paper Utilization Council. The booklet lists prohibited materials and outthrows, their most common sources and the reasons they cause trouble. Another section is devoted to the marking systems in use. Copies of this booklet are available from Waste Paper Utilization Council, 122 East 42nd St., New York, N. Y.

USDA Reports

STATION PAPERS. Two Station Papers are available from the Southeastern Forest Experiment Station of the United States Department of Agriculture:

No. 91—Silvical Characteristics of Pond Pine by Karl F. Wenger.

No. 93—Forest Insect Conditions in the Southeast During 1957 by W. F. McCambridge, W. P. Nagel and R. J. Kowal.

Write to Joseph F. Pechanec, director, Southeastern Forest Experiment Station, Asheville, N. C.

THREE PUBLICATIONS that are available from the U. S. Forest Products Laboratory are: "A Graphic Method of Estimating Veneer Drying Rates"—No. 2104; "Report on Progress in Development of Testing Methods for Fiberboard"—No. 2105, and "Development of Testing Methods for Evaluating the Machining Qualities of Wood and Wood-base Materials"—No. 2108. Copies of these publications are available free of charge by writing to the director, U. S. Forest Products Laboratory, Madison 5, Wis.

TECHNICAL NOTES. Here is a listing of Technical Notes that are available: No. 531—"Trend of Pulpwood Harvest Up in Wisconsin, Particularly in Central Area"; No. 532—"Early Thinnings Have Increased Forking in a Northern Hardwood Stand"; No. 533—"Effects of Pruning on the Form Growth of a Red Pine Plantation"; No. 534—"Lumber Purchases by Seven Manufacturing Industry Groups in Minneapolis and St. Paul, 1956"; No. 535—"Hypoxylon Infection Not Greatly Influenced by Sex of Aspen Trees", and No. 536—"Growth and Development of 10 Seed Sources of Scotch Pine in Lower Michigan". Copies are available by writing to M. B. Dickerman, director Lake States Forest Experiment Station, U. S. Department of Agriculture, St. Paul 1, Minn.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Variable speed control

U. S. Electrical Motors Inc. has completely revised a full-color brochure on the operation and application of the Varitrol variable speed drive and pneumatic control systems. A special feature of the new brochure is the announcement of a U. S. innovation—pre-engineered Varitrol instrumentation packages.

Circle No. 52 on Readers' Service Card

Plasticized steel

Devcon Corp. discusses the many uses of Plastic Steel in a bulletin now being offered. Plastic Steel has a putty consistency that has many uses such as making molds, repairing machinery, etc. Other products developed by Devcon are also discussed in the bulletin.

Circle No. 53 on Readers' Service Card

Protective coating

Wisconsin Protective Coating Co. is offering a technical bulletin describing the company's phenolic-epoxy air-dry protective coating. This coating, known as Plasite No. 7122, may be used for the protection of steel tanks, wet end of paper machines, fume hoods and ducts and other such applications.

Circle No. 54 on Readers' Service Card

Check valves

Fairbanks Co. decribes its complete line of bronze and iron body check valves in a new bulletin now being offered by the company. Included in the bulletin are illustrations, descriptions and service recommendations.

Circle No. 55 on Readers' Service Card

Electric monitor

Electric Regulator Corp. announces the availability of a new catalog sheet describing its Model 4.010 Monitor—an electric monitoring system that detects conditions of voltage, frequency and phase in any power source.

Circle No. 56 on Readers' Service Card

Bulk trucks

Sprout, Waldron & Co. Inc. has announced the availability of a special bulletin describing pneu-

PUT ACTION IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

matic bulk trucks for the handling of chemical and industrial materials. The advantages of bulk handling and specific information on possible cost savings are also included.

Circle No. 57 on Readers' Service Card

Watertight concrete

Master Builders Co. is offering a folder giving a factual summary of authoritative thought on the design and specification of watertight concrete. Discussion covers the basic requirements for watertight concrete and how Pozzolith reduces permeability, shrinkage, bleeding and segregation to produce strong, durable structural concrete that is highly resistant to the penetration of water under normal conditions

Circle No. 58 on Readers' Service Card

Debarker

Carl W. Mullis Engineering & Mfg. Co. Inc. has published a booklet fully describing the Mullis log skinner—a unit designed to debark any kind of log, hardwood or soft, straight or crooked, etc. Descriptions and photos are given on the sections of the unit along with over-all specifications.

Circle No. 59 on Readers' Service Card

Stainless steel fittings

Ladish Co. announces a new 86-page master reference volume on stainless steel pipe fittings. The volume gives detailed information on a broad line of both IPS and tube OD welding fittings, screwed and socket welding fittings and ASA, MSS and corrosion weight flanges. A technical section includes data on manufacturing standards, specifications, data on welding of stainless steel and corrosion resistance tables. The volume is well-bound and tab-indexed for quick reference.

Circle No. 60 on Readers' Service Card

Unit for measuring fluid rate of flow

Schutte & Koerting Co. has just prepared a bulletin describing the company's line of bypass rotameters for measuring fluid rate of flow in pipelines 2 in. in diameter and larger. The rotameters are applicable to both liquids and gases. A complete installation is described in the bulletin.

Circle No. 61 on Readers' Service Card

Sodium benzoate and benzoic acid

Hooker Chemical Corp. has published a bulletin titled, "Hooker Sodium Benzoate and Berzoic Acid". Besides describing many uses, the bulletin also lists the physical properties and available forms and technical grades of sodium benzoate and benzoic acid.

Circle No. 62 on Readers' Service Card

Log grapples

Electric Steel Foundry Co. has announced its complete line of log grapples in an illustrated catalog just published. Close-up photographs of each model, as well as action shots of each grapple in field use, are shown.

Circle No. 63 on Readers' Service Card

Automatic controls

Barber-Colman Co. has released a new automatic controls catalog. The catalog describes and illustrates the company's line of automatic controls for heating, ventilating and air conditioning control systems. Operational and application data are incorporated with the decription of each control component.

Circle No. 64 on Readers' Service Card

Analyzer for moisture determination

Ridgefield Instrumentation Div., Schulmberger Well Surveying Corp. announces new literature describing the nuclear magnetic resonance (NMR) analyzer. This analyzer is used for moisture determination in paperboard pulp, both unbleached sulfite and semi-bleached kraft. The report details the steps in sample preparation and NMR testing and concludes with a presentation of calibration curves for bleached sulfite and semi-bleached kraft.

Circle No. 65 on Readers' Service Card

The Paper Industry
Professional and Business Services

J. E. SIRRINE COMPANY
ENGINEERS
GREENVILLE, SOUTH CAROLINA

Design	Consultations
Paper & Pulp	Reports
Water & Waste	Appraisals
Steam & Hydro Power	Steam Utilization

Handling newsprint aboard ship

Hyster Co. shows complete handling steps involved in supplying water-borne shipments of newsprint to two of the West Coast's largest newspapers in a new 12-min. color film. The movie is available for showing without cost.

Circle No. 66 on Readers' Service Card

Annunciator

Panellit Inc. has just released a bulletin describing and illustrating its new completely integrated, space-saving, economical Panalarm Series 61 annunciator. As many as 96 points in an operating system can be monitored by this unit.

Circle No. 67 on Readers' Service Card

Metal treatment that conquers rust

Rusticide Products Co. describes its product, Ospho, in a four-page folder now being issued. Ospho is a metal treatment that can be applied to rusted metal. Paint applied over Ospho is said to adhere so tightly that moisture cannot get through to attack the metal.

Circle No. 68 on Readers' Service Card

Drives

Reliance Electric & Engineering Co. announces a new booklet describing the Reliance VS drives. The booklet illustrates in brief copy, full-color photographs and diagrams how the drives operate and may be applied to various types of machinery.

Circle No. 69 on Readers' Service Card

Horizontal size presses

Patton Mfg. Co. Inc. in a new brochure, includes complete description of horizontal size presses. Illustrations and engineering diagrams of typical installations are also given.

Circle No. 70 on Readers' Service Card

Non-flux-calcined diatomaceous silicas

Sole Chemical Corp. recently released a data sheet describing three grades of nonflux-calcined diatomaceous silicas—the AG, TOP and SUPER. Recommended uses and other information on these three grades are given.

Circle No. 71 on Readers' Service Card

Pneumatic conveyor design

Sprout, Waldron & Co. Inc. is offering an eight-page technical article giving background information on how to select and operate pneumatic systems for transporting dry bulk materials.

Circle No. 72 on Readers' Service Card

CLASSIFIED ADVERTISING

CONFIDENTIAL EMPLOYMENT SERVICE

For employers seeking new personnel and mill executives seeking new positions. We invite your inquiry.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington Street LIberty 2-6547 Boston 8, Mass.

FOR SALE — SURPLUS PAPER MILL EQUIPMENT

Dozens of pieces of paper mill equipment — chippers, rolls, head boxes, pumps, etc. Some new, some used but with a lot of good service still ahead of them. For complete listing and full details contact Purchasing Department, Section A, Box 570, Savannah, Georgia.

WILLIAMS-GRAY COMPANY
221 North LaSalle Street, Chicago 1, Illinois

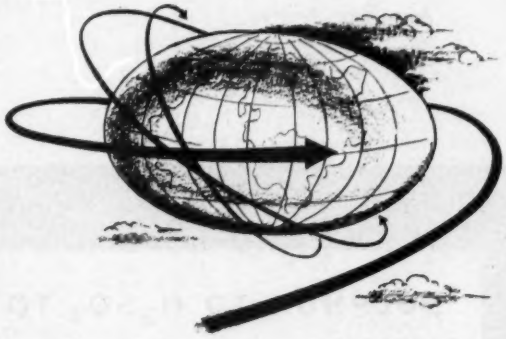
Paul Foster • Peter Talbot • Ross Lawrence

Herb Fishburn • Wes Gallup • Bill French

Lindsay & Niagara Wires
Knox Woolen Felts
Mount Vernon Dryer Felts
Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

NEW BUSINESS

IN EXPANDING EXPORT FIELD



Our Customers are looking for Paper Board and allied products.

If securing new business for 1959 is important to you, contact our main office at . .

CASTEX PAPER EXPORT CO. INC.
& A. M. Capen's Sons, Inc.

17 Battery Pl., N.Y. 4, N.Y. • Cable Address: Joeward, N.Y.

SUPERINTENDENT

FOREMEN

Top pay and outstanding management benefits offered. Southeast location. Established pulp and paper manufacturer converting one Fourdrinier to coated board.

QUALIFICATIONS

SUPERINTENDENT — minimum of two years experience as Foreman or Superintendent in charge of production of board on Fourdrinier machine, including grades of coated board.

FOREMEN — minimum of two years as machine tender (or foreman) on Fourdrinier machine making coated board. Proven ability as tour foreman or leadership ability.

These are outstanding opportunities for qualified men. Interviews can be arranged locally or at plant.

For detailed information submit resume or inquiry in complete confidence to

Box 670
The Paper Industry

ENGINEERS

with

Pulp, Paper or Board Experience

Top pay and outstanding management benefits offered. Southeast location. Established pulp and paper manufacturer converting Fourdrinier to coated board.

Project Engineers needed in Design Engineering and in Process Evaluation. Positions open at all levels for M. E.'s, Ch. E.'s, and C.E.'s.

These are outstanding opportunities for qualified engineers in a fast growing company, but small enough that individual contributions will be recognized and rewarded.

Interviews can be arranged locally or at our plant. For detailed information submit resume or inquiry in complete confidence to

Box 671
The Paper Industry

29% Fertilizer
(Superphosphate; ammonium sulphate)
21% Chemicals
9% Petroleum
7% Paint & Pigment
5% Steel
4% Rayon
2% Others

Tinker to Evers to Chance . . . Those of us with gray hair remember well that sure-fire, double play combination of the old Chicago Cubs.

Sulphur, too, is playing the major role in many an industrial 'double play'. With Sulphuric Acid as the keystone derivative, Sulphur is serving six major processing industries with big tonnages and countless others requiring smaller tonnages.

In this connection, the following statistics may be of interest:

The sulphuric acid industry consumes 82% of all elemental sulphur and its equivalent produced in the States. Of this 82%, about two-thirds comes from Frasch Process Sulphur and from the treatment of natural sour gas. The balance is from pyrite, roaster gases, recycling of spent acids, etc.

Texas Gulf, the leading producer of Frasch mined and sour gas Sulphur, has always been and will continue to be industry's reliable source of supply. Recently, a new mine in Texas came into production. Other developments both in mining and sour gas-treatment are nearing completion. To broaden its service to users of Sulphur, Texas Gulf recently inaugurated shipments of molten Sulphur. Distribution centers are being set up.

To be a leader in industry, a company must give service and develop in anticipation of needs. This role, Texas Gulf Sulphur will continue to play to the best of its resources and ability.

SULPHUR PRODUCING UNITS

Newgulf, Texas • Spindletop, Texas
• Moss Bluff, Texas • Worland, Wyoming
• Fannett, Texas

TEXAS GULF SULPHUR CO.

75 East 45th Street, New York 17, N.Y
811 Rusk Avenue, Houston 2, Texas

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	.70—	.75
No. 2 roofing (Chicago)	.50—	.55
Twos and blues, repacked	1.50—	1.75
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt. — Nominal

- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt. — Nominal

- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	90.00—	100.00
No. 1 hard white shavings	80.00—	85.00
No. 1 soft white shavings	50.00—	55.00
Soft white shavings, uncoated	50.00—	55.00
Fly leaf shavings No. 1	25.00—	27 50
Fly leaf, woody, No. 1	23.00—	25.00
Mixed colored shavings	21.00—	23.00
No. 1 books and magazines	17.00—	18.00
Ledger stock, white, No. 1	50.00—	52.50
Ledger stock colored, No. 1 (Midwest ship)	30.00—	
New manila envelope cuttings (free of groundwood)	60.00—	65.00
New manila envelope cuttings (containing groundwood)	50.00—	55.00
Manila tab cards	75.00—	80.00
Colored tab cards	50.00—	55.00
New northern kraft envelope cuttings	60.00—	65.00
Triple sorted kraft, 100%	30.00—	35.00
No. 1 old kraft	30.00—	
White news cuts, No. 1	55.00—	60.00
No. 1 overissue news	22.00—	24.00
Folded news, special	20.00—	21.00
Folded news, ordinary	18.00—	19.00
Old corrugated boxes	24.00—	25.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	11.00—	13.00
Boxboard cuttings	9.00—	11.00
No. 1 mixed paper	9.00—	11.00

CHEMICALS

F.o.b. New York City

Alum, ammonium		
Granular, bags, works, cwt.	4.30—	
Lump, drums, works, cwt.	5.05—	
Powdered, drums, works, cwt.	5.20—	
1-Arginine, drums, kilo	60.00—	
Blanc Fixe		
Direct process, bags, c.l., works, ton	145.00—	
L. c. l., ton	155.00—	
Bleaching Powder, drums, cwt.	—	
Casein, domestic acid precipitated		
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—	
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—	
China Clay, domestic dry-ground, airfloat, 99%		
325-mesh bags, c.l., Georgia works, ton	10.00—	12.00
300-mesh bags, c.l., Georgia works, ton	13.50—	14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00—	35.00
Chlorine, liquid		
Tanks, single units, works, freight equaled, cwt.	3.15—	
Glycerine, refined (CP, USP) 98%, drums c. l., delivered lb.	29½—	
Litharge, commercial powdered		
Barrels, c. l., works, freight equaled lb	.14¾—	
Rosin, gum, c. l., f.o.b. New York, cwt.		
K, M	9.05—	
N	9.20—	
WG	9.70—	
WW	9.80—	
Rosin, wood, c. l., f.o.b., shipping point, cwt.		
K, M.	7.80—	
N	7.90—	
WG	8.25—	
WW	8.50—	
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—	
Soda Ash		
Dense, 58%, paper bags, c.l. works, cwt	1.90—	
Light, 58%, paper bags, c.l. works, cwt	1.85—	
Soda, caustic		
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—	
Solid, 76%, drums, c. l. works, cwt.	4.80—	
Sodium Silicate		
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.55—	
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—	
Starch		
Pearl, 140-lb. bags, cwt.	7.51—	
Pearl, 100-lb. bags, cwt.	7.36—	
Powdered, 100-lb. paper bags, cwt.	7.48—	
Sulfur, crude		
Bulk, c. l. mine, contract, long ton	23.50—	
Talc		
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—	
Canadian, ground, bags, c. l. works, ton	20.00—	35.00
Titanium Pigment		
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—	
High-tinting, drums, c. l., lb.	.14⅜—	
Zinc Oxide Pigment, American process		
Lead-free, bags, c. l. freight allowed, lb.	.14½—	
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—	

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—167.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100 00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):		
No. 1 enamels		20.05
No. 2 enamels		19.05
Machine-coated, 45- to 100-lb.	15.05—	18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)		17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)		16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):		per cwt
100% rag		64.70
75% "		49.65
50% "		37.80
25% "		31.90
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):		
100% rag		65.85
75% "		50.80
50% "		39.00
25% "		33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):		
No. 1		22.50
No. 2		21.75
No. 4		20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):		
No. 1		23.70
No. 2		22.95
No. 4		21.55
Newsprint (contract base price)		per ton
Rolls, standard		135.00
Sheets	Standard differentials	

Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.50
60-lb.	8.75
50-lb.	9.00
40-lb.	9.25
35-lb.	9.75
30-lb.	10.50
25-lb.	11.25
20-lb.	12.25
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.00

Sheets — Plus 50c cwt

Pipe, fittings, valves and pumps

(Continued from Page 524)

signed to give continuous service over extended periods of time. This is not a place to economize. Money spent for high-quality units specifically designed for boiler feed service is money well spent.

It is sound practice to select two or more smaller pumps instead of a larger unit and to provide a spare pump so that one unit is always available for maintenance or routine inspection. The most practical boiler feed pumping system is one where all of the boilers are fed from the same pumps with a common pump discharge header. The older mills that have their original low-pressure boilers and new high-pressure units will naturally have two or more boiler feed pumping systems.

The low-pressure feedwater system on the suction side of the boiler feed pumps may be constructed of piping manufactured in accordance with ASTM A-53. The low-pressure system must be designed with consideration for expansion, but the expansion is not so great since the temperature is usually not high.

Valves for boiler feed service are selected according to whether they are to be installed on the suction side or on the discharge side of the boiler feed pumps. Valves for the suction side may be cast with bronze trim or cast carbon steel with stainless steel trim depending on the temperature and pressure. Valves for the discharge side must be cast carbon steel with stainless steel trim.

Gas and fuel oil systems

Where gas or oil are used as boiler fuels, piping systems must be provided up to the burner. The ASA Code for Pressure Piping dictates the piping materials to be used. Both gas and oil piping is usually carbon steel. The valves may be either carbon steel or cast iron, depending upon the pressure. Lubricated plug valves are used extensively in gas service, but other valves may be used if designed for gas service.

Turbine lubrication system

The lubrication system of a turbo-generator is a vital part of a power plant and a potential source of great trouble. It must be designed and constructed in such a way as to assure a constant supply of clean oil to all points of the unit requiring lubrication and to prevent the possibility of oil leaks that might bring oil into contact with high-temperature parts of the turbine or piping with a resulting fire hazard.

Lubrication piping should be seamless carbon steel conforming to ASTM A-106 and should be pickled to remove mill scale and rust, oiled inside and out and have the ends plugged before shipment. The pipe should be Schedule 80 wall thickness.

Piping measuring 2 in. and smaller should be socket welded. For sizes 2½ in and larger butt welds with split type backing rings should be used. No screwed joints should be used. Flanged joints should be used only where required to connect to flanged valves or equipment. Gaskets should be spirally wound metal and asbestos. Flanges should be Class 300 with concentric serrated raised faces. Valves should be forged or cast steel of Class 300 and should have stainless steel trim.

Extreme care should be exercised to keep foreign matter out of the system. All open piping ends and connections should be kept plugged to keep out dust, dirt, moisture, etc. The finished system should be flushed with solvent or flushing oil.

Boiler blow down system

Carbon steel piping manufactured in accordance with ASTM A-106 is normally used for both continuous and intermittent boiler blow down. Valves used in this service must be of special construction. There are several valves on the market specially designed for boiler blow down service.

Boiler feedwater make-up system

The boiler feedwater make-up system is of major importance in any type of power plant but is of more importance in pulp and paper mill power plants because as much as 50 per cent of the condensate from the steam generated in the boiler must be replaced due to the fact that it is used in processes from which it cannot be recovered.

The piping materials required in boiler feedwater make-up systems depend upon the feedwater treatment process used, and the process used depends upon the quality of the raw water that must be treated.

Materials that are used in the various processes are carbon steel, cast iron, stainless steel, polyvinyl chloride, rubber-lined steel, copper, brass and saran-lined steel. Other materials are used occasionally.

HARLEY GOODRICH (third from left) receives the Distinguished-Service-to-Safety-Award during the National Safety Congress. Long active in the organized safety movement, Goodrich is a past general chairman of the Pulp & Paper Section. Shown with the Strathmore Paper Co. maintenance engineer are (l to r): Robert Belknap, general chairman of the section; Ned Dearborn, president of the National Safety Council, who announced his retirement during the Chicago gathering, and Earl Ripstra of Container Corp. of America.

National Safety Congress

(Continued from Page 527)

Dowd, Fritz Publications Inc. (*Contest*); Gordon B. Lemke, Employers Mutuals of Wausau (*Special Projects*); Leo M. Shaw, General Foods Corp. (Carton & Container Div.) (*Off-the-Job Safety*); Franklin Larrabee, St. Regis Paper Co. (*Pulpwood Logging*); Harry J. Hahn, Hammermill Paper Co. (*Pulp Manufacturing*); Robert J. Gell, Eastman Kodak Co. (Paper Mills Div.) (*Paper Manufacturing*); Harold Hewitt, Bemis Bros. Bag Co. (*Bag*); H. R. Mesler Jr., Ruberoid Co. (*Roofing*); Budwin J. Lee, Wood Conversion Co. (*Insulation*); Harold E. Tebo, Eastman Kodak Co. (Baryta Div.) (*Specialties*); Jack Dunman, Mengel Co. (*Shipping Containers*); Carl J. Lamberth, Container Corp. of America (O. B. Andrews Div.) (*Folding Carton*).

Index to Advertisers

Acme Steel Company
Adell Chemical Company
Albany Felt Company 509
American Cast Iron Pipe Co.
American Cyanamid Co.
American Paper & Pulp Co., Inc.
Anheuser-Busch, Inc.
Antara Chemicals
Appleton Wire Works, Inc. 508
Appleton Wood Products Co. 571
Arrow Tank Co., Inc.
Aten-Hill Mfg. Co.
Atkins Saw Division

Bauer Bros. Co., The
Beloit Iron Works 534, 549, 551
Bird Machine Company 532
Black-Clawson Company, The 519
Bolton & Sons Inc., John W.
Bowsher Co., The N. P.
Buell Engineering Company 537
Burgess-Manning Company 560

Cameron Machine Co.
Carthage Machine Co.
Castex Paper Export Co. Inc. 567
Chemipulp Process, Inc.
Chicago Bridge & Iron Company 520
Clarage Fan Company
Classified Advertising 567
Clinton Corn Processing Co.
Corn Products Sales Co.

Darling & Company 536
Dempster Brothers 540
DeZurik Corporation 550
Draper Brothers Company 543
Du Pont, Pigments Department

Eastwood-Nealley Corporation 561
Electric Eye Equipment Co.
English China Clays Sales Corp. 564
EPIC, Inc.

Fisher Governor Co.
Fitchburg Screen Plate Co., Inc.
Fritz Publications, Inc. 564

General Chemical Division, Allied Chemical Corp.
General Dyestuff Company
Georgia Kaolin Company
Gulf States Paper Corporation 567

Hanchett Manufacturing Co. 541
Hart-Moisture-Meters
Hills-McCanna Company
Horton Manufacturing Co., Inc. 543
Hubinger Company, The
Humphrey Elevator Company 562
Huyck Felt Co. 555

Illinois Gear & Machine Company
Improved Machinery, Inc. ..... 2nd Cover
Ingersoll-Rand

Jenkins Sons, Inc., M. W. 546
Johnson Corporation, The 558
Jones & Sons Company, E. D. 506

Kalamazoo Tank & Silo Co. 559
Kamyr Inc.

Ladish Co. 529
Langston Co., Samuel M. 528
Lawson Company, The
Layne & Bowler, Inc. 544
Lestoil, Inc.
Lindsay Wire Weaving Co., The
Link-Belt Company 511
Lockport Felt Company
Lodding Engineering Corp.

Magline Inc. 558
Marathon Southern Corporation
Maxson Automatic Machinery Co.
Moisture Register Co. 563
Murray Mfg. Co., D. J.

Nash Engineering Co., The 547
National Aluminate Corp. ..... 1st Cover
National Safety Council 566
Naylor Pipe Company 501
Northwest Engineering Company
Norton Company

Paper Industry, The 564
Parsons & Whittemore/Lyddon Organization
Penick & Ford, Ltd., Inc. ..... 4th Cover
Perkins & Son, Inc., B. F.
Phillips Company Inc.
Photovolt Corporation 571
Poirier Control Company 542
Powell Valves 510
Power Stainless Products Co.
Pusey & Jones Corp., The 539

Charles P. Raymond Service, Inc.
Rogers & Co., Samuel C. 560

St. Regis Paper Company 507
Sandy Hill Iron & Brass Works, The
Scapa Dryers, Inc.
Shuler & Benninghofen 531
Smidth & Co., F. L. ..... 3rd Cover
Standard Oil Co. (Indiana) 530
Stickle Steam Specialties Co. 548

Taylor-Wharton Co. 556
Tennessee Corporation
Texas Gulf Sulphur Co. 568
Titanium Pigment Corp. 502

United Engineering & Foundry Company

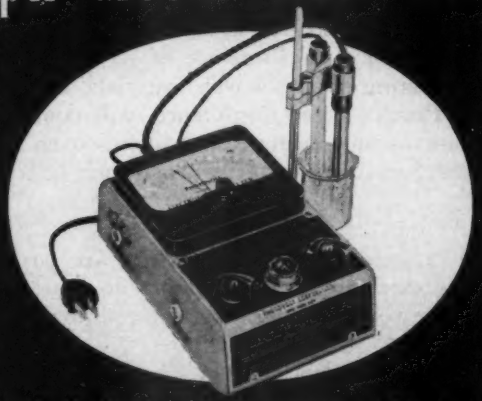
Valley Iron Works Company 552
Vanderbilt Co., R. T. 504

Washington Steel Corp.
Waterbury Felt Company 564
Weyerhaeuser Timber Co.
Williams-Gray Company 567

Yarnall-Waring Company

Professional & Business Service Section
Sirrine Company, J. E. 560

PHOTOVOLT
pH Meter MOD. 115



A full-fledged line-operated pH Meter of remarkable accuracy at the unprecedented price of $145.-
(Complete with electrodes)

Write for Bulletin #225 to

PHOTOVOLT CORP.
95 MADISON AVE NEW YORK 16, N. Y.

NOW THERE IS A NEW IMPROVED SLOTTED END OF GRAIN

SUCTION BOX COVER

The characteristics of end grain Maple naturally provide a smooth, even, long wearing surface. Laminated plastic cross members support the Maple end grain lands. LOVAC construction eliminates sag.

Check these features

★ ELIMINATES STREAKING
★ LESS PINHOLES
★ LESSENS CLOGGING
★ GIVES LONGER WIRE LIFE
★ EVEN VACUUM
★ BETTER FIBRE FORMATION
★ BETTER TENSILE STRENGTH

MADE BY THE MANUFACTURER OF RES-LIN AND MET-AL-RIB SUCTION BOX COVERS

Write for nearest representative, data sheet and literature.

APPLETON WOOD PRODUCTS CO. APPLETON · WISCONSIN

PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

Desiccant dusts lethal to insects

Desiccant dusts that dry insects to death are viewed with increasing interest by desiccant manufacturers. Silica aerogels are already being sold for experimental insect control.

These dusts absorb the waxy protective layer that surrounds the insect's body and conserves its body moisture. Once the waxy layer is removed, the insect is literally dehydrated. Experiments have shown that desiccant dusts cause death in insects more quickly than do chlordane or DDT — and there is no possibility of developing an immunity.

Fertilizer pellets for forest seedlings

Crown Zellerbach Corp. has developed a slowly-dissolving ¾-in. dia. pellet containing urea formaldehyde resins and superphosphate for use as a fertilizer when transplanting seedlings. The pellets are dropped into the planting holes when the seedlings are planted, and reports show that growth of the seedlings is improved by 60 per cent when compared to that of untreated seedlings. Since the pellet dissolves slowly, it causes no burns to the root system. Its cost of application amounts to about $10.00 per acre.

An engineering understanding of the structure of papermaking materials needed

An engineering approach to the design and utilization of synthetic and natural fibers in paper or non-woven materials has been advocated by Walter J. Hamburger of Fabric Research Laboratories Inc. in order to blend craftmanship with modern science for the purpose of full exploitation of the paper industry's opportunities.

This would entail a need for characterizing the structure of paper and non-wovens in a geometrical model to permit a mathematical analysis of their response to forces and deformations, as well as arriving at certain generalizations applicable to the mechanical performance of unwoven structures. Real progress in the engineering of non-woven materials, Dr. Hamburger said at the 13th Tappi Plastics-Paper Conference, will come only after numerous and intensive microscopic examinations of unwoven structures, with emphasis on inherent characteristics of fibers and their structural geometry.

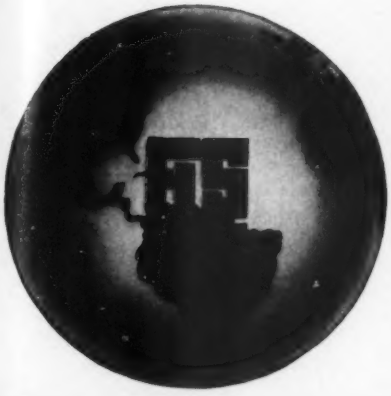
Lease plan as a sales booster

Cameron Machine Co. has put a lease plan into effect that will enable a paper manufacturer to use new slitting and roll winding equipment immediately instead of continuing to work with obsolete machines that reduce the mill's productivity.

Among claimed advantages of this plan are: (1) Machinery delivered is the only collateral required; (2) working capital and credit remain intact; (3) lease cost is treated as expense for tax purposes, and (4) leasing lets productive new equipment pay for itself while it builds working capital and credit.

Cost of papermaking capacity

The current cost of new papermaking capacity is estimated at about $100,000 per daily ton of paper. A 33-per cent expansion program, envisaged for the paper industry over the next 6-7 years, accordingly would call for a capital expenditure of over $3,000,000,000.



Smidth

For Reburning Lime Sludge

We are specialists in the design and manufacture of rotary kilns, coolers and auxiliary equipment for burning lime, lime sludge and for many other purposes.

Over 1,250 Smidth rotary kilns have been furnished all over the world.

F. L. SMIDTH & CO.
Engineers and Machinery Manufacturers
11 West 42nd Street • New York, N.Y.

F. L. Smidth & Co., A/S
77 Vigerslev Alle
Copenhagen, Denmark

F. L. Smidth & Co., Ltd.
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co. (Bombay) Private Ltd.
42 Queen's Road
Bombay, India

I can do everything better . . .

ADHESIVE QUALITY

Take the Adhesive Quality on Coatings for instance . . . Higher adhesive properties in Penford Gums make less gum necessary, permit a greater percentage of the pigment — for more sparkling brilliance.

IMPROVED PIGMENT DISPERSING PROPERTIES

On to Dispersing Pigments . . . Improved properties make Penford Gums exceptionally strong dispersing agents for pigments.

vows Mr. P. G.

GOOD LEVELING PROPERTIES

And where Good Leveling Properties are desired . . . Penford Gums' water-holding ability makes sure that the coating remains on the surface longer—permits the coating to be leveled uniformly without lumping or crowfooting.

Call or write our Technical Service Department today for suggestions how you can add versatility to your coatings.

Penford Gums

Leaders in Epoxy Starches

PENICK & FORD, LTD.

INCORPORATED

750 THIRD AVE., NEW YORK 17, N. Y.; 1531 MARIETTA BLVD., ATLANTA, GA.; CEDAR RAPIDS, IOWA; 18 CALIFORNIA ST., SAN FRANCISCO 11, CALIF.